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ABSTRACT

This guide is intended for use in presenting courses in viticulture and enology to prepare individuals for the following occupations: vineyard supervisor, grape grower, grape harvest worker, winemaker, cellar master, and winery worker. The guide includes descriptions of these occupations taken from the "Dictionary of Occupational Titles," the course requirements for an associate of applied science degree in viticulture and enology at Grayson County College in Texas, descriptions of the required courses, course syllabi, a brief description of the Developing a Curriculum (DACUM) process, a list of duties and tasks covered in the curriculum, performance steps involved in the tasks, performance objectives, evaluation measures, and a 14-page bibliography. As a part of the vitology curriculum, performance steps are provided for a total of 66 tasks in the following 8 duty areas: establishing the vineyard, maintaining and operating a water management system, managing the soil, managing the plant canopy, controlling pests, marketing the crop, managing crop levels and quality, and harvesting the crop. The enology curriculum for making white wine covers 83 tasks in the following 10 duty areas: coordinating the harvest schedule, preparing for the crush, receiving fresh grapes, processing grapes, fermenting the juice, clarifying the still wine, clearing the wine, packaging it, sanitizing the equipment, and performing off-season duties. The enology curriculum for making red wine covers 76 tasks in 12 similar duty areas. (MN)

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VITICULTURE AND ENOLOGY
CURRICULUM

Roy E. Renfro

Instructional Director
Curriculum Development Grant
87-1030-A-2

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INTRODUCTION

The purpose of this project was to develop a viticulture and enology curriculum for the emerging Texas grape and wine industry. This was accomplished through the achievement of six objectives (1) validation of the current viticulture and enology curriculum, (2) development of a new viticulture and enology curriculum with outcome competencies using the DACUM (Develop A Curriculum) Process, (3) development of learning activities and evaluation measures, (4) identification of learning materials consistent with identified learning activities, (5) development of course syllabi for courses and (6) marketing of the newly developed curriculum.

After the curriculum was verified the project director, working with industry authorities and using the DACUM Process, identified outcome competencies for wine production and grape growing occupations. Once the competencies were identified the project director, industry authorities and media specialists identified learning and evaluation activities. Once again, the DACUM Process was used to give structure to the planning. Each DACUM Process required input from approximately ten professionals taking three full days of dialogue to complete.

The project director, assisted by media personnel, identified and organized instructional materials for the viticulture and enology curriculum areas. This was achieved by reviewing material from other institutions and conducting an international library search.

The final step of the development process was the writing of course syllabi. After identifying a model syllabus, the director with assistance from the technical staff developed a syllabus for each course.

After completion of the development process, selected material was used to pilot test one part of the curriculum. The pilot test was conducted in a seminar setting providing time for participants to evaluate the competencies and the materials.

The final step of the project was in marketing the newly developed curriculum ensuring that there was articulation between prospective students, the college and the emerging industry.

DESCRIPTIONS OF OCCUPATIONAL TITLES

VINEYARD SUPERVISOR. Supervises and coordinates activities of workers engaged in planting, cultivating and harvesting berry crops, such as cranberries and grapes: Confers with manager to evaluate weather and soil conditions and to develop plans and procedures. Hires workers and explains and demonstrates field work-techniques and safety-regulations to inexperienced workers. Assigns duties, such as tilling soil, planting, cultivating and spraying vines, and gathering berries, to farmworkers and oversees work activities. Attaches farm implement, such as disc, planter, and fertilizer, and herbicide spreader, to tractor, and drives tractor in fields to plant and cultivate vines. May adjust and repair farm machinery. May irrigate fields. May cut plant runners and uprights to thin vines and stimulate growth, using pruning tools.

GRAPE GROWER. Plants and cultivates fruit bushes and vines and harvests crops, such as grapes, cranberries, and strawberries, applying knowledge of growth characteristics of specific varieties and soil, climate, and market conditions: Determines varieties and quantities of plants to be grown, acreage to be tilled, and employees to be hired. Selects and purchases plant stock and farm machines, implements, and supplies. Decides when and how to plant, bud, graft, prune, sucker, cultivate and irrigate plants, and harvest crop, based on knowledge of vine-crop culture. Attaches farm implements, such as harrow and ditcher, to tractor and drives tractor in fields to till soil. Drives and operates farm machiney to spray fertilizers, herbicides, and pesticides and haul fruit boxes. Hires, assigns duties to, and oversees activities of seasonal workers engaged in tilling and irrigating soil; pruning plants; and harvesting and marketing crop. Demonstrates and explains farm work techniques and safety regulations. Maintains employee and financial records. Makes arrangements with buyers for sale and shipment of crop. May make arrangements with airplane pilot to spray and dust fertilizers and pesticides on planted acreage. May install irrigation system(s) and irrigate fields. May set poles, string wires on poles to form trellises, and tie vines and canes to trellis wires. May prune vines and canes to size and shape growth. May lubricate, adjust and make minor repairs on farm machinery, implements, and equipment, using oilcan, grease gun, and hand-tools, such as hammer and wrench.

GRAPE HARVEST WORKER. Harvests grapes according to method appropriate for type of fruit, by hand or using tools, such as shears, rubber mallet, pronged scoop, or hooked pole: Carries and positions work aids, such as ladders, canvas drop-cloths, and buckets. Selects fruit to be harvested, according to size, shape, and color. Grasps, twists, and pulls fruit, snips stems, and shakes trees and vines to separate crop from plant and places fruit into bags, buckets, or trays, exercising care to avoid plant and fruit damage. Empties filled containers into collection boxes and bins. May stand on ladders or elevated platforms, stoop over plants, or crawl along rows to reach fruit. May measure fruit, using gages. May pour fruit through screens when removing foreign matter, such as twigs and grasses. May dump fruit from containers onto conveyors or load containers onto trucks or wagons. May remove ladders, debris, boxes, and discarded fruit from fields and bogs to clean growing areas. May collect fallen nuts into piles, using rake. May carry and position irrigation pipes.

WINE MAKER. Directs and coordinates all activities of winery concerned with production of wine: Contracts with growers to provide fruit for processing or cooperates with horticulturist of company vineyard in grape production. Examines grape samples to ascertain presence and extent of such factors as sugar and acid content, and ripeness. Orders grapes picked when analysis indicates they are at degree of ripeness desired. Coordinates processes and directs workers concerned with testing and crushing grapes, fermenting juice, fortifying, clarifying, aging, and finishing of wine, including cooling, filtering, and bottling. Blends wines according to formulas or knowledge and experience in wine making. May develop new processes to improve product. When processing champagne may be designated as champagne maker (vinous liquors).

CELLAR MASTER. Supervises and coordinates activities of workers engaged in operation of winery cellars: Directs workers in crushing grapes, fermenting and fortifying juice, finishing and aging wine, operating portable pumps to transfer wine, and racking wine (filtering). Inspects fermentation tanks for cleanliness and operation of valves and other accessories. Orders filling of tanks and adds yeast culture to must in tanks to promote fermentation. Turns valves to circulate ferment through heat exchangers or other devices to maintain vintage at specified temperature. Observes gages and records readings.

WINERY WORKER. Performs any combination of following tasks involved in winemaking: Lifts bulk grapes or dried pomace onto conveyor leading to crusher, disintegrator, or de-alcoholizer still, using pitchfork. Connects portable pumps between tanks

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and turns valves to pump wine and alcohol from fermenting and fortifying tanks to tanks that cool wine to prevent further fermentation. Pumps chilled wine into clarifying tanks and adds prescribed chemicals to wine. Starts agitator that mixes solution to induce sedimentation of wine particles. Pumps clarified wines through filtering tanks into tank to obtain blended wine. Pumps wine through pasteurizer to prevent wine spoilage. Pumps pasteurized wine through filtering device to collect sediment and precipitates and then into tanks in bottling room. Tends press that separates juice from pomace and starts conveyor that transports residue to storage. Cleans and sterilizes fermenting and fortifying tanks and railroad tank cars, using airhose and soda ash.

*Source: _Dictionary of Occupational Titles_. Fourth Edition, 1977., U.S. Department of Labor

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GRAYSON COUNTY COLLEGE

VITICULTURE AND ENOLOGY

Associate of Applied Science

Freshman Year

First Semester

SUBJECT	COURSE TITLE	LEC/LAB/CR*
VIEN 1310	Principles of Viticulture I	(2-3-3)
HORT 1330	Plant Physiology	(3-0-3)
CHEM 1310	Horticultural Chemistry	(2-2-3)
ENGL 1310	Freshman Composition I	(3-0-3)
HIST 1310	United States History	(3-0-3)
OREN 1110	Orientation	(1-0-1)
		16 Hours

Second Semester

SUBJECT	COURSE TITLE	LEC/LAB/CR*
VIEN 1320	Principles of Viticulture II	(2-3-3)
HORT 1340	Soils and Fertilizers	(3-0-3)
ENGL 1320	Freshman Composition II	(3-0-3)
CSCI 1340	Microcomputers	(2-2-3)
MATH 1310	College Algebra	(3-0-3)
		15 Hours

*Lecture/Laboratory/Credit Hours

Sophomore Year

First Semester

SUBJECT	COURSE TITLE	LEC/LAB/CR*
VIEN 2310	Principles of Enology I	(2-3-3)
VIEN 2330	Wine Types and Sensory Evaluation	(2-3-3)
VIEN 2220	Coordinated Work Experience	(0-12-2)
HORT 1380	Irrigation and Drainage Systems	(2-2-3)
ELEC 2320	Motors and Motor Controls	(3-0-3)
SPCH 1310	Fundamentals of Speech	(3-0-3)
		17 Hours

Second Semester

SUBJECT	COURSE TITLE	LEC/LAB/CR*
VIEN 2320	Principles of Enology II	(2-3-3)
VIEN 2340	Analysis of Must and Wine	(2-3-3)
VIEN 2230	Coordinated Work Experience	(0-10-2)
GOVT 2320	State and Local Government	(3-0-3)
ELECTIVE		(0-0-6)
		17 hours

*Lecture/Laboratory/Credit Hours

COURSE DESCRIPTIONS

VITICULTURE & ENOLOGY

VIEN 1110. Grapevine Propagation Techniques. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: reproduction, propagation by cuttings, propagation by rootings, greenhouse propagation, rootstocks, budding, grafting, and layering.

VIEN 1115. Grapevine Grafting Techniques. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: propagation, field grafting, types of grafts, changing varieties, high-level, green, bench, and rapid method.

VIEN 1120. Vineyard Trellising. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential training elements: types of systems, stakes, posts, wire, stapling, trellis design, end posts, anchors, row direction, and trellis for mechanical harvesting.

VIEN 1125. Vineyard Irrigation Practices. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential training elements: general principles, soil moisture, quantity of water, time and frequency, quality of irrigation water, and distribution of irrigation water.

VIEN 1130. Vineyard Pruning Practices. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: objectives, definitions, length of bearing units, effects of pruning, techniques and tools for pruning.

VIEN 1135. Winery Equipment & Operation. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: winery design, winery departments, crushing operations, fermenting operations, stuck wines, fortification, storage of wines.

VIEN 1140. Wine Filtration Techniques. (1-0-1). This course is designed to train students entering the field of viticulture and enology the following essential elements: bulk filtration, polishing filtration, sterilizations filtration, centrifugation, and filtration equipment.

VIEN 1145. Wine Development & Blending. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: pasteurization, fining, fining agents, fining tests, fannin and gelatin fining, casein fining, bentonite fining, isinglass, egg albumen, pectic enzymes, carbon and blending procedures.

VIEN 1150. Wine Cellaring. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: aging of wine, finishing of wine, racking, cellar operations, refrigeration, and microbiological stabilization.

VIEN 1155. Wine Bottling Techniques. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: types of bottles, bottling equipment, filling procedures, corks and corking, inspection and storage tests, labeling, casing, and quality control.

VIEN 2110. Vineyard Pest Management. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential training elements: insects, animals, fungi, and viruses that attack various parts of the vineyard and methods of prevention and control.

VIEN 2115. Grapevine Nutrition. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: chemical elements of the grapevine, functions of elements, response to fertilizer, determining the need, rate and manner application.

VIEN 2120. Vineyard Management. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: accounting principles, bookkeeping, cost accounting, principles of management.

VIEN 2125. Grape Marketing. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: principles of marketing, strategic planning, analysis, developing new markets.

VIEN 2130. Computers in Vineyard Management. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: introduction to personal computers, software packages, spreadsheet analysis, and word processing.

VIEN 2135. Wine Microbiology. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: types, identification of yeast and bacteria, starter cultures, fermentation and sanitation, sterile techniques and plating of cultures, organism isolation and counting chambers.

VIEN 2140. Sensory Evaluation of Wine. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: purpose, appearance, odor, taste, flavor, scoring wines numerically, hedonic and flavor profile.

VIEN 2145. Wine Marketing. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: marketing principles, marketing audit, developing a marketing plan, product, promotion, pricing, place and developing new markets.

VIEN 2150. Winery Accounting and Taxation. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: utilizing optional tax accounting methods, organizational structures, vineyard expense accounting, estate planning.

VIEN 2155. Wine and the Law. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: understanding of federal, state, and local regulations, winery/distribution contracts, out-of-state sales, antitrust compliances, and enforcement procedures.

VIEN 2160. Computers in Winery Management. (1-0-1). This course is designed to train students entering the field of viticulture and enology with the following essential elements: computer terminology, hardware capabilities, operating systems, languages, custom vs. packaged software, computer applications for financial planning, and wine production information.

VIEN 2220. Coordinated Work Experience. (0-12-2). Students are employed under the supervision of qualified employers and the college coordinator. A written report to the coordinator is required from each student and employer. Prerequisite: consent of instructor.

VIEN 2230. Coordinated Work Experience. (0-10-2). Students are employed under the supervision of qualified employers and the college coordinator. A written report to the coordinator is required from each student and employer. Prerequisite: consent of instructor.

VIEN 1310. Principles of Viticulture I. (2-3-3). This course is designed to train students entering the field of viticulture and enology with the following essential elements: basic principles underlying pruning, training, grafting, and propagation of vines; climatic requirements; utilization of crop; economic factors affecting choice of vineyard type and location.

VIEN 1320. Principles of Viticulture II. (2-3-3). This course is designed to train students entering the field of viticulture and enology with the following essential elements: economic and scientific principles of recommended vineyard management practices including irrigation, mineral and carbohydrate nutrition, flower development and fruit set, viral and fungal diseases, and insect control.

VIEN 2330. Wine Types and Sensory Evaluation. (2-3-3). This course is designed to train students entering the field of viticulture and enology with the following essential elements: major types of wines and factors affecting their quality such as growing region, grape maturity, harvesting, vinification, cellaring, blending and storage; principles of sensory evaluation.

VIEN 2310. Principles of Enology I. (2-3-3). This course is designed to train students entering the field of viticulture and enology with the following essential elements: history and development of the wine industry; factors affecting wine quality; winemaking operations, including harvest, scheduling, crushing, fermentation, and record keeping.

VIEN 2320. Principles of Enology II.(2-3-3). This course is a continuation of VIEN 2310. It will train students entering the field of viticulture and enology with the following essential elements: safety, sanitation procedures, analysis and operation of enology facility equipment.

VIEN 2340. Analysis of Must and Wine. (2-3-3). This course is designed to train students entering the field of viticulture and enology with the following essential elements: principles and practice of wine and fermented beverage analysis including tests for free and total SO2, volatile and titratable acidity, ph, Brix and total alcohol. Prerequisite: Chemistry 1310.

VIEN 2350. Winegrowing Regions of the World. (2-3-3). This course is designed to train students entering the field of viticulture and enology with the following essential elements: A comprehensive investigation of the major winegrowing regions of the world including history, viticulture and enological practices and procedures, wine types and sensory evaluation.

RELATED COURSES

CHEM 1310. Horticultural Chemistry. (2-2-3). Fundamentals of inorganic chemistry and organic chemistry as applied to fertilizers, soils, pesticides and other products used in the cultural interactions with plants. Familiarization with chemical elements, compounds, and nomenclature is stressed.

CSCI 1340. Microcomputers. (2-2-3). Microcomputers and their uses in business and personal computing. Solving business problems using BASIC programming language with hands-on training in microcomputers operations.

ELEC 2320. Motors and Motor Controls. (3-0-3). Practical approach to the study of basic motor theory, application and methods used in the control of various systems. Basic electricity reviewed, along with general motor theory. Emphasis on fractional horsepower, polyphase, D.C. and synchronous motor theory and application. Controls, protection, and maintenance covered for each four basic groups outlined above. Reference to various industrial standards and codes, primarily the National Manufacturers Association (NEMA) and the National Electrical Code (NEC).

HORT 1330. Plant Physiology. (3-0-3). Application of physical and biological principles to the understanding of plant processes involved in assimilation, metabolism, and regulation of growth and development.

HORT 1340. Soils and Fertilizers. (3-0-3). Origin, formation and physical properties of soils and plant food elements, economic uses of organic matter and commercial fertilizers.

HORT 1380. Irrigation and Drainage Systems. (2-2-3). Surface and sub-surface drainage of landscape areas. Design and installation of manual and automatic sprinkler systems for golf courses, parks, and landscaped facilities. Equipment and machinery.

SYLLABUS

COURSE: VIEN 1110. GRAPEVINE PROPAGATION TECHNIQUES

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: reproduction, propagation by cuttings, propagation by rootings, greenhouse propagation, rootstocks, budding, grafting, and layering.

TEXTS USED: *Grape Growing* by Weaver.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Reproduction in grapevines
---Propagation of vines by cuttings and rootings
---Greenhouse propagation by green cuttings
---Propagation using rootstocks
---Field budding
---Bench grafting
---Layering
---Tissue culture

Skill Development Sessions

---Propagation by cuttings and rootings
---Greenwood propagation
---Rootstock propagation
---Field budding
---Bench grafting
---Layering

SYLLABUS

COURSE: VIEN 1115. GRAPEVINE GRAFTING TECHNIQUES

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: propagation, field grafting, types of grafts, changing varieties, high-level, green, bench, and rapid method.

TEXTS USED: *General Viticulture* by Winkler, et al.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Purpose of grafting.
---Requirements for successful grafting.
---Influence of grafting on the characters of stock and scion.
---Bench grafting.
---Planting and care of the nursery.

Skill Development Sessions

---Bench grafting.
---Machine and hand grafting techniques.
---Planting benchgrafts.

SYLLABUS

COURSE: VIEN 1120. VINEYARD TRELLISING

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential training elements: types of systems, stakes, posts, wire, stapling, trellis design, end posts, anchors, row direction, and trellis for mechanical harvesting.

TEXTS USED: General Viticulture by Winkler, et al.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Types of systems.
---Types of stakes.
---Types of posts.
---Types of wire.
---Types of stapling.
---Trellis design.
---End posts.
---Anchors.
---Row direction.
---Trellis for mechanical harvesting.

SYLLABUS

COURSE: VIEN 1125. VINEYARD IRRIGATION PRACTICES

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential training elements; general principles, soil moisture, quality of water, time and frequency, quality of irrigation water, and distribution of irrigation water.

TEXTS USED: General Viticulture by Winkler, et al.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---General principles.
---Soil moisture.
---Quantity of water.
---Time and frequency.
---Quality of irrigation water.
---Distribution of irrigation water.

SYLLABUS

COURSE: VIEN 1130. VINEYARD PRUNING PRACTICES

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: objectives, definitions, length of bearing units, effects of pruning, techniques and tools for pruning.

TEXTS USED: General Viticulture by Winkler, et al.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Objectives.
---Definition.
---Length of bearing units.
---Effects of pruning.
---Techniques and tools for pruning.

SYLLABUS

COURSE: VIEN 1135. WINERY EQUIPMENT AND OPERATION

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: winery design, winery departments, crushing operations, fermenting operations, stuck vines, fortification, storage of wines.

TEXTS USED: *The Technology of Wine Making* by Amerine, et al.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week

SUBJECT OUTLINE

Lecture Sessions

---Winery design.
---Winery departments.
---Crushing operations.
---Fermenting operations.
---Stuck wines.
---Fortification.
---Storage of wines.

SYLLABUS

COURSE: VIEN 1140. WINE FILTRATION TECHNIQUES

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology the following essential elements: bulk filtration, polishing filtration, sterilizations filtration, centrifugation, and filtration equipment.

TEXTS USED: The Technology of Wine Making by Amerine, et al.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Bulk filteration.
---Polishing filtration.
---Sterilizations filteration.
---Centrifugation.
---Filteration equipment.

SYLLABUS

COURSE: VIEN 1145. WINE DEVELOPMENT AND BLENDING

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: pasteurization, fining, fining agents, fining tests, fannin and gelatin fining, casein fining, bentonite fining, isinglass, egg albumen, pectic enzymes, carbon and blending procedures.

TEXTS USED: *The Technology of Wine Making* by Amerine, et al.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Pasteurization.
---Fining.
---Fining agents.
---Fining tests.
---Fannin and gelatin fining.
---Casein fining.
---Bentonite fining.
---Isinglass.
---Egg albumen.
---Pectic enzymes.
---Carbon and blending procedures.

SYLLABUS

COURSE: VIEN 1150. WINE CELLARING

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: aging of wine, finishing of wine, racking, cellar operations, refrigeration, and microbiological stabilization.

TEXTS USED: Modern Winemaking by Jackisch.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Aging of wine.
---Finishing of wine.
---Racking.
---Cellar operations.
---Refrigeration.
---Microbiological stabilization.

SYLLABUS

COURSE: VIEN 1155. WINE BOTTLING TECHNIQUES

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: types of bottles, bottling equipment, filling procedures, corks and corking, inspection and storage tests, labeling, casing, and quality control.

TEXTS USED: Commercial Winemaking Processing and Controls by Vine.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Types of bottles.
---Bottling equipment.
---Filling procedures.
---Corks and corking.
---Inspection and storage tests.
---Labeling.
---Casing.
---Quality control.

SYLLABUS

COURSE: VIEN 2110. VINEYARD PEST MANAGEMENT

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential training elements: insects, animals, fungi, and viruses that attack various parts of the vineyard and methods of prevention and control.

TEXTS USED: Grape Pest Management by UCD.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Insects that attack various parts of the vineyard.
---Animals that attack various parts of the vineyard.
---Fungus diseases.
---Virus diseases.

SYLLABUS

COURSE: VIEN 2115. GRAPEVINE NUTRITION

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: chemical elements of the grapevine, functions of elements, response to fertilizer, determining the need, rate and manner application.

TEXTS USED: *General Viticulture* by Winkler, et al.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Chemical elements of the grapevine.
---Functions of elements.
---Response to fertilizer.
---Determining the need.
---Rate and manner of application.

SYLLABUS

COURSE: VIEN 2120. VINEYARD MANAGEMENT

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: principles of marketing, strategic planning, analysis, developing new markets.

TEXTS USED: Materials developed from several references.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Accounting principles.
---Bookkeeping.
---Cost accounting.
---Principles of management.

SYLLABUS

COURSE: VIEN 2125. GRAPE MARKETING

COURSE DESCRIPTION: This course is desgined to train students entering the field of viticulture and enology with the following essential elements: principles of marketing, strategic planning, analysis, developing new markets.

TEXTS USED: Materials developed from several references.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Principles of marketing.
---Strategies planning.
---Analysis.
---Developing new markets.

SYLLABUS

COURSE: VIEN 2130. COMPUTERS IN VINEYARD MANAGEMENT

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: introduction to personal computers, software packages, spreadsheet analysis, and word processing.

TEXTS USED: Materials developed from several references.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Introduction to personal computers.
---Software packages.
---Spreadsheet analysis.
---Word processing.

SYLLABUS

COURSE: VIEN 2135. WINE MICROBIOLOGY

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: types, identification of yeast and bacteria, starter cultures, fermentation and sanitation, sterile techniques and plating of cultures, organism isolation and counting chambers.

TEXTS USED: The Technology of Wine Making by Amerine, et al.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Types.
---Identification of yeast and bacteria.
---Starter cultures.
---Fermentation and sanitation.
---Sterile techniques and plating of cultures.
---Organism isolation and counting chambers.

SYLLABUS

COURSE: VIEN 2140. SENSORY EVALUATIONS OF WINE

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: purpose, appearance, odor, taste, flavor, scoring wines numerically, hedonic and flavor profile.

TEXTS USED: *Wines: Their Sensory Evaluation* by Amerine, et al.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Purpose.
---Appearance.
---Odor.
---Taste.
---Flavor.
---Scoring wines numerically.
---Hedonic and flavor profile.

SYLLABUS

COURSE: VIEN 2145. WINE MARKETING

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: marketing principles, marketing audit, developing a marketing plan, product, promotion, pricing, place and developing new markets.

TEXTS USED: Materials developed from several references.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Marketing principles.
---Marketing audit.
---Developing a marketing plan.
---Product.
---Promotion.
---Pricing.
---Place and developing new markets.

SYLLABUS

COURSE: VIEN 2150. WINERY ACCOUNTING AND TAXATION

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: utilizing optional tax accounting methods, organizational structures, vineyard expense accounting, estate planning.

TEXTS USED: Materials developed from several references.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Utilizing optional tax accounting methods.
---Organizational structures.
---Vineyard expense accounting.
---Estate planning.

SYLLABUS

COURSE: VIEN 2155. WINE AND THE LAW

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: understanding of federal, state and local regulations, winery/ distribution contracts, out-of-state sales, antitrust compliances, and enforcement procedures.

TEXTS USED: Materials developed from several references.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Understanding federal, state and local regulations.
---Winery/distribution contracts.
---Out-of-state sales.
---Antitrust compliances.
---Enforcement procedures.

SYLLABUS

COURSE: VIEN 2160. COMPUTERS IN WINERY MANAGEMENT

COURSE DESCRIPTION: This course is designed to train students entering the field of viticulture and enology with the following essential elements: computer terminology, hardware capabilities, operating systems, languages, custom vs. packaged software, computer applications for financial planning, and wine production information.

TEXTS USED: Materials developed from several references.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture one hour per week.

SUBJECT OUTLINE:

Lecture Sessions

---Computer terminology.
---Hardware capabilities.
---Operating systems.
---Languages.
---Custom vs. packages software.

SYLLABUS

COURSE: VIEN 2220. COORDINATED WORK EXPERIENCE

COURSE DESCRIPTION: Students are employed under the supervision of qualified employers and the college coordinator. A written report to the coordinator is required from each student and employer.

TEXTS USED: No text book.

ENTRY LEVEL: Sophomore standing.

COURSE FORMAT: Work experience.

SYLLABUS

COURSE: VIEN 2230. COORDINATED WORK EXPERIENCE

COURSE DESCRIPTION: Students are employed under the supervision of qualified employers and the college coordinator. A written report to the coordinator is required from each student and employer.

TEXTS USED: No text book.

ENTRY LEVEL: Sophomore standing.

COURSE FORMAT: Work experience.

SYLLABUS

COURSE: VIEN 1310. PRINCIPLES OF VITICULTURE I

COURSE DESCRIPTION: An introduction to grape culture, stressing the unique features of the vine as a cultivated crop.

TEXTS USED: Grape Growing by R. J. Weaver.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture two hours, laboratory three hours per week.

SUBJECT OUTLINE:

Lecture Sessions

---Introduction to grape growing.
---Botanical classification.
---Grapevine photosynthesis.
---Vine growth and development.
---Grape growing areas of the world.
---Soils and water (irrigation).
---Vine nutrition.
---Vine propagation.
---Establishing a vineyard and vine training.
---Grape quality (raisin, table and wine).
---Harvest and postharvest.
---Pruning.
---Vine diseases.
---Vineyard insects.
---Vineyard weeds.

Laboratory Sessions

---Vine morphology.
---Wine grape identification.
---Table/raisin grape identification.
---Vineyard sampling techniques.
---Vineyard equipment, American hybrids, phylloxera.
---Grafting, rootstock varieties.
---Grape virus, bacterial and fungal diseases.
---Pruning - head trained vines.
---Pruning - cordon and cane pruned vines.

SYLLABUS

COURSE: VIEN 1320. PRINCIPLES OF VITICULTURE II

COURSE DESCRIPTION:

- ---Learn the taxonomic characteristics of grapevines by which varieties are distinguished.
- ---Be able to identify approximately 60 wine, table, raisin, and rootstock varieties.
- ---Know the history and use of these varieties and the Texas climatic regions to which each is best adapted.
- ---Be familiar with approximately 15 Vitis species and know their general distribution and horticultural value.
- ---Be familiar with the historical origins and spread of grape cultivation in the world.
- ---Understand Texas trends in grape cultivation and varietal distribution.
- ---Know the major viticultural areas of the world and understand how viticulture in these places either differs from or is similar to that in Texas.
- ---Be familiar with both established and developing methods by which new grape varieties are generated.
- ---Understand what a clone is.
- ---Become familiar with the major grape root pests and recognize the symptoms they produce.
- ---Become familiar with the major grape virus diseases and recognize the symptoms they produce.
- ---Learn how to make raisins.

TEXTS USED: General Viticulture by Winkler, et al.

ENTRY LEVEL: Prerequisite: Principles of Viticulture I or consent of division director.

COURSE FORMAT: Lecture two hours, laboratory three hours per week.

SUBJECT OUTLINE:

Lecture Sessions

- ---Grapevine taxonomic characteristics.
- ---Climatic regions of the United States.
- ---Wine grape varieties - identification, history, and use.
- ---Raisin and table grape varieties - identification, history, and use.
- ---Rootstock varieties - identification, history and use.
- ---Vitis species - distribution, characteristics, and value.

---Grape genetics and breeding.
---Clones.
---Texas and United States viticulture - history and trends.
---Grape root pests (phylloxera and nematodes).
---Grape virus diseases.
---Morphology, phenology; yield components.
---Training and pruning systems.
---Responses to pruning and thinning.
---Radiation laws, light in canopies, morphogenesis.
---Microclimate and energy balance.
---Modelling vine growth.
---Winterkill, bud dormancy and release.
---Frost injury and protection.
---Cell and vine water relations and growth.
---Irrigation practices.
---Mineral nutrition.
---Fertilizer practices.
---Regulation of fruit growth.
---Fruit maturity and quality factor.
---Climatic regions and geographical grape growing areas in California; general characteristics of each. Definition of macro-, meso- and micro-climates.
---Establishing the vineyard: preplanting decisions, systems of planting, vine and row spacing, row direction.
---Methods of weed control; herbicides vs. cultivation.
---Vine training and development during the growing season; the first three years.
---Summer pruning; various reasons for the techniques. Effects on vine and fruit.
---Photosynthesis - factors affecting.
---Trellis systems, types, advantages and disadvantages. Principles of canopy management practices.
---Physiology of flower initiation. Effect of climatic factors on fruit bud initiation.
---Carbohydrate nutrition: tissue seasonal levels; translocation, utilization and storage; factors affecting accumulation.
---Flower development; factors affecting, structure of three types; flower type and variety behavior. Variations in degree of fertilization between varieties; techniques to improve fruit-set; pollination and factors affecting.
---Thinning, girdling, hormones: effects on fruit and vine; effects on seedless vs. seeded varieties; techniques of treatment and effects of timing.
---Fungal diseases - Powdery mildew, Botrythis bunch rot, Eutypa dieback, Oakroot fungus, Phomopsis cane and leaf spot, Black Measles; symptoms and control measures.
---Bacterial diseases.
---Insect pests. Leaf hoppers, mites, thrips, OLR, Grape Leaf Folder, Grape Leaf Skeletonizer, cutworms.

Laboratory Sessions

---Spur pruning of mature vines.
---Cane pruning of mature vines.
---Fertilizer trial.
---Training and spur pruning of young vines.
---Training and cane pruning of young vines.
---Analysis of fruit composition.
---Propagation techniques.

SYLLABUS

COURSE: VIEN 2310. PRINCIPLES OF ENOLOGY I

COURSE DESCRIPTION: This course is intended to serve as a broad overview of all aspects of wines for those students with a general or secondary interest as well as the introductory course for those intending to specialize in enology or fermentation science. While some emphasis is placed upon the history, uses, geography, physiology and folklore of wine, appreciation is also developed of the fundamental science and practical technology involved in commercial wine production.

TEXT USED: *Wine, An Introduction* by M. A. Amerine and V. L. Singleton.

ENTRY LEVEL: No prerequisites.

COURSE FORMAT: Lecture two hours, laboratory three hours per week. A winery tour, video, and visual aids are used to supplement lecture-text material. Three major examinations and final.

SUBJECT OUTLINE:

---Introduction, classes of wine, wine literature.
---Wine and the physiology and sociology of alcohol.
---Grapes for wine: varieties, climate, culture.
---Yeasts, fermentation, other microorganisms and wine.
---Unit operations in the winery.
---Making table wines.
---Unit operations in the winery.
---Making table wines.
---Making sparkling wines.
---Making dessert wines.
---Specialty winery products.
---Tour of experimental winery.
---Finishing wines, defects, by-products.
---History of wine.
---French wines, Northern Africa.
---Wines of Spain and Southern Europe.
---Wines of Germany, Central Europe and Asia.
---Wines of Australia, South Africa, Central and South America.
---Wines of the U.S. (except California), Canada.
---California: history, development, types and standards.
---Evaluation, tasting procedures, use, and service of wine.
---Special topics, opportunities in the industry, review.

SYLLABUS

COURSE: VIEN 2320. PRINCIPLES OF ENOLOGY II

COURSE DESCRIPTION: To teach prinicples and practice of making wines. The topical areas of main emphasis are: the physical and chemical properties of grape juice and wine, yeast metabolism and physiology, fermentation conditions and process control, finishing process and wine industry.

TEXT USED: Technology of Winemaking, 4th edition, AVI.

ENTRY LEVEL: Principles of Viticulture I, Principles of Viticulture II, Principles of Enology I, or consent of division director.

COURSE FORMAT: Lecture two hours, laboratory three hours per week. Three major examinations and final.

SUBJECT OUTLINE:

Lecture Sessions

---Wine regions, grape varieties and legal restrictions.
---Juice and must preparation, grape sampling, maturity, and crop level.
---Crushing and pressing methods.
---Physical and chemical properties of grape juice relevant to wine making.
---Yeast metabolism, physiology, and genetic characteristics.
---Fermentation kinetics and yeast growth
---Special fermentation problems and malolactic fermentation.
---White wine production.
---White wine production.
---Red wine production.
---Red wine production.
---Sparkling wines production.
---Dessert wine production.
---Finishing processs: fining, filtration, enzyme treatment, and other post treatments.
---Wine stability: spoilage problems.
---Aging, cooperage, storage, transportation, and other handling problems.
---Presentation and discussion of laboratory results.
---Perspectives: future technology of wine making.

Laboratory Sessions

---The effect of physical and chemical properties of the grape juice and musts on the wine fermentation.
---The effect of fermentation variables on the wine fermentation.
---Wine analysis: sugar, acidity, ethanol, glycerol, higher alcohols, organic acids, phenolics, S02, esters, acetaldehyde, cell concentration, nitrogen source and amino acids.
---Yeast metabolism and ethanol fermentation.

SYLLABUS

COURSE: VIEN 2330. WINE TYPES AND SENSORY EVALUATION.

COURSE DESCRIPTION: This course is designed for students interested in critical analysis of wines and factors influencing their sensory properties. Principles of sensory evaluation are introduced in lectures and used in the labs to evaluate the color, aroma, and taste of wines. Composition and sensory characteristics of wine varietals and of wines produced using various viticultural and enological variables are discussed and evaluated in detail.

TEXTS USED: Wines, Their Sensory Evaluation by Amerine and Roessler.

ENTRY LEVEL: Sophomore standing or consent of division director.

COURSE FORMAT: Lecture two hours, laboratory three hours. Three major examinations and final.

SUBJECT OUTLINE:

---Types of tests used for sensory evaluation.
---Rating scales, descriptive analysis.
---Selection and training of judges.
---Administration of sensory tests.
---Scorecards.
---Statistical interpretation of sensory tests.
---Flavor chemistry.
---Enological assets and defects of white and red varieties.
---Effects of specific enological or viticultural treatments on wine sensory properties.

SYLLABUS

COURSE: VIEN 2340. ANALYSIS OF MUSTS AND WINES

COURSE DESCRIPTION: This course is intended to instruct students in the principles and practices of some of the physical and chemical analysis that are pertinent to Enology and Viticulture and related fields.

TEXTS USED: *Methods for Analysis of Musts and Wines* by Amerine and Ough.

ENTRY LEVEL: Sophomore standing or consent of the division director.

COURSE FORMAT: Lectures two hours, laboratory three hours per week. Three major examinations and final.

SUBJECT OUTLINE:

Lecture Sessions

- ---Reasons for analysis of wines: legal, operational indication of quality, general sources of error. Principles of total acidity, pH, volatile acidity measurements.
- ---Principles of hydrometry and refractometry. Sugar determinations. Chemical, enzymatic and HPLC.
- ---Principles of alcohol measurements: separation, chemical and physical reactions.
- ---Principles of separation and volumetric analyses for acetaldehyde and sulfur dioxide.
- ---Principles of flame photometry and complimetric titrations.
- ---Principles of atomic absorption and spectrophotometric analysis. Separation and preparation of samples.
- ---Principles of chromatography. Paper, thin layer, column and gas-liquid. Preparation of samples. Chemical methods for tartaric, malic and lactic acids. Enzymatic and HPLC methods.
- ---Chemistry of the measurment of nitrogen components (protein, ammonia, amino acids, total N).
- ---Principles of practical color measurement of wines.
- ---Principle of selective-ion measurements. Colorimetry of the phenols.

Laboratory Sessions

- ---Must and wine analysis for total and volatile acids and pH.
- ---Analysis for Brix and reducing sugar.

---Analysis for alcohol by hydrometer, chemical and gas-liquid chromatographic methods.
---Analysis for acetaldehyde and sulfur dioxide. Volumetric procedures.
---Analysis for K by flame photogmetry. Sorbic acid analysis.
---Analysis of Cu and Fe. Chemical and atomic absorption.
---Preparation of paper and/or thin layer separation of organic acids. Tartaric acid measurement by colorimetric procedure.
---Measurement of either proline by direct anlysis, total nitrogen by Kjeldahl or amino acids by HPLC.
---Interpretation of spectrophotometric curves. Color in wines. Enzyme analysis.
---Measurement of dissolved oxygen. Colorimetric determination of phenols. CO2 titrations.

DACUM
(Develop A Curriculum)

DACUM is a relatively new and innovative approach to occupational analysis. It has proven to be a very effective method of quickly determining, at relatively low cost, the competencies or tasks that must be performed by persons employed in a given job or occupational area.

The profile chart that results from the DACUM analysis is a detailed and graphic portrayal of the skills or compentencies involved in the occupation being studied. The DACUM analysis can be used as a basis for (1) curriculum development, (2) student learning, (3) training needs assessments, (4) worker performance evaluations, and (5) competency test developments.

DACUM has been successfully used to analyze occupations at the professional, technical, skilled, and semiskilled levels. DACUM operates on the following three premises: (1) expert workers are better able to describe/define their job than anyone else, (2) any job can be effectively and sufficiently described in terms of the tasks that successful workers in that occupation perform, and (3) all tasks have direct implications for the knowledge and attitudes that workers must have in order to perform the tasks correctly.

A carefully chosen group of about 10-12 experts from the occupational area form the DACUM committee. Committee members are recruited directly from business, industry, or the professions. The committee works for two days under the guidance of a facilitator to develop the DACUM chart. Modified small-group brainstorming techniques are used to obtain the collective expertise and consensus of the committee.

The DACUM committee is carefully guided through each of the following steps by the coordinator:

1. Orientation
2. Review of job or occupational area description
3. Identification of general areas of job responsibility
4. Identification of specific tasks performed in each of the general areas of responsibility
5. Review and refinement of task statements

6. Sequencing of task statements

7. Identification of entry-level tasks

8. Other options, as desired

Because of their current occupational expertise, committee participants do not need to make any advance preparations. Participants on past DACUM committees have, without exception, found the activity to be a professionally stimulating and rewarding experience.

DUTIES AND TASKS

CURRICULUM: VITICULTURE

I. ESTABLISHING THE VINEYARD

  A. Planning market strategies

  B. Developing budgets and determining financial resources

  C. Selecting vineyard site

  D. Selecting root stock/variety

  E. Ordering plants and vineyard supplies

  F. Training labor force

  G. Maintaining and operating equipment/tools

  H. Propagating plants

  I. Preparing land

  J. Laying-out vineyard

  K. Designing and installing water system

  L. Selecting and constructing trellis system

  M. Planting the vineyard

  N. Training vines

  O. Planning for pest control

  P. Keeping written records

  Q. Replanting vineyard skips

II. MAINTAINING AND OPERATING WATER MANAGEMENT SYSTEM

  A. Maintaining power source

B. Maintaining supply and quality
C. Testing soil moisture
D. Treating Water
E. Scheduling irrigation
F. Maintaining water system
G. Utilizing water system for plant/vineyard management
H. Winterizing the system

III. MANAGING THE SOIL
A. Checking plants for mineral deficiency
B. Testing soil and petiole
C. Applying fertilizers
D. Cultivating the soil
E. Preventing erosion

IV. MANAGING THE PLANT CANOPY
A. Pruning, training and tying the vine
B. Positioning the shoots
C. Thinning leaves
D. Hedging the vines
E. Suckering the vines
F. Maintaining the trellis
G. Protecting vineyard after harvest
H. Winterizing plants

V. CONTROLLING PESTS

   A. Inspecting for pests
   B. Determining timing of prevention
   C. Maintaining, operating and calibrating sprayers
   D. Complying with pesticide regulations/maintaining written records
   E. Applying pre-emergent and post-emergent herbicides
   F. Installing bird nets or bird control devices
   G. Maintaining fencing
   H. Setting gopher traps
   I. Sanitizing the vineyard/equipment

VI. MARKETING THE CROP

   A. Identifying market sources
   B. Negotiating contracts
   C. Determining harvest parameters

VII. MANAGING CROP LEVELS AND QUALITY

   A. Determining optimum crop levels
   B. Pruning dormant plants
   C. Thinning clusters and determining bunch positioning
   D. Applying growth regulators
   E. Girdling
   F. Scheduling irrigation

VIII. HARVESTING THE CROP

- A. Testing harvest parameters
- B. Coordinating harvest schedule with winery/broker
- C. Hiring laborers
- D. Preparing harvest containers and equipment
- E. Supervising harvest operations
- F. Applying preservatives and preparing crop for transport
- G. Transporting grape crop
- H. Completing contract
- I. Repairing, cleaning and storing harvest equipment
- J. Implementing post-harvest operations

DUTIES AND TASKS

CURRICULUM: ENOLOGY (WHITE WINE)

I. COORDINATING HARVEST SCHEDULE
  A. Determining harvest date
  B. Estimating yields/needs
  C. Preparing grapes for transporting
  D. Preparing winery for receiving of grapes
  E. Keeping records
  F. Controlling quality at harvest

II. PREPARING FOR THE CRUSH
  A. Cleaning/sanitizing of equipment (hoses, pumps, crusher, press, tanks
  B. Preparing cooperage
  C. Testing and arranging equipment
  D. Preparing cooling system
  E. Ordering of supplies, yeast enzymes, chemical, bottles
  F. Stocking the laboratory
  G. Preparing the yeast culture
  H. Managing records
  I. Controlling quality at crush

III. RECEIVING FRESH GRAPES

A. Weighing the grapes

B. Unloading the grapes

C. Sorting the grapes

D. Holding/storing the grapes

E. Keeping records

F. Controlling quality

VII. PROCESSING OF GRAPES

A. Crushing and destemming the grapes

B. Adding of sulfite

C. Cooling the must

D. Transferring must to primary fermenter

E. Dejuicing

F. Transferring must to press

G. Pressing the must

H. Disposing of pomace

I. Analyzing the juice

J. Removing insoluble solids (racking, centrif, filtering)

K. Adding other amelioration

L. Analyzing the juice

M. Adding enzymes, yeast

N. Keeping records

O. Controlling quality

V. FERMENTING THE JUICE

A. Monitoring temperature and rate of fermentation

B. Racking the wine as required

C. Completing fermentation (French style)

D. Stopping fermentation (German style)

E. Keeping records

F. Testing the wine and recording the results

G. Tasting wine

H. Controlling quality

VI. CLARIFYING THE STILL WINE

A. Adding fining agents

B. Racking wine

C. Filtering with pads

D. Filtering with DE

E. Stabilizing wine with cold temperatures

F. Filtering and centrifuging the wine

G. Testing and correcting wine

H. Keeping records

I. Testing wine and recording results

J. Tasting wine

K. Controlling quality

VII. CELLARING THE WINE

A. Aging wine in tanks and barrels

B. Aging wine in barrels (French style)

C. Topping-up barrels (French style)

D. Testing and correcting wine

E. Blending the wine (German style)

F. Blending the wine

G. Keeping records

H. Testing the wine and recording the results

I. Tasting wine

J. Controlling quality

VIII. PACKAGING THE WINE

A. Testing wine to prepare for bottling

B. Filtering prior to bottling

C. Arranging winery for bottling

D. Preparing line for bottling

E. Bottling wine

F. Closuring, capsuling, labeling, and casing

G. Storing wine

H. Releasing wine for sale

I. Keeping records

J. Testing wine and recording results

K. Tasting wine

L. Controlling quality

IX. SANITIZING THE EQUIPMENT

A. Preparing winery for tourists

PERFORMING OFF-SEASON DUTIES

A. Winterizing, sanitizing and repairing equipment

B. Keeping records

C. Testing wine and recording results

D. Tasting wine

E. Controlling quality

DUTIES AND TASKS

CURRICULUM: ENOLOGY (RED WINE)

I. COORDINATING HARVEST SCHEDULE

   A. Sampling the field
   B. Estimating yields/needs
   C. Harvesting
   D. Scheduling receiving of grapes
   E. Preparing grapes for transporting
   F. Keeping records
   G. Controlling quality

II. PREPARING FOR THE CRUSH

   A. Cleaning/sanitizing of equipment (hoses, pumps, crusher, press, tanks)
   B. Testing and arranging equipment
   C. Preparing cooperage
   D. Preparing cooling system
   E. Ordering of supplies, yeast enzymes, chemicals, bottles
   F. Restocking the laboratory
   G. Starting the yeast culture
   H. Keeping records

I. Controlling quality

III. RECEIVING FRESH GRAPES

A. Weighing the grapes

B. Unloading and sorting the grapes

C. Sorting the grapes/handpicked only

D. Holding/storing the grapes

E. Keeping records

F. Controlling quality

IV. PROCESSING OF GRAPES

A. Crushing and destemming grapes

B. Adding of sulfite

C. Transferring must to primary fermenter

D. Analyzing must

E. Adding enzymes and yeast

F. Adding other amelioration

G. Keeping records

H. Controlling quality

V. FERMENTING THE MUST

A. Preparing malo-lactic fermentation
B. Breaking up the cap
C. Monitoring the fermentation
D. Inoculating with malo-lactic bacteria
E. Pressing the wine
F. Transferring to secondary fermenter and monitoring residual sugars
G. Disposing of pomace
H. Monitoring temperature and rate of fermentation
I. Restarting stuck fermentation
J. Stopping fermemtation
K. Tasting wine
L. Keeping records
M. Controlling quality

VI. CLARIFYING THE STILL WINE
   A. Racking wine as required
   B. Filtering and disposing of lees
   C. Stabilizing wine with cold temperatures
   D. Fining and filtering/centrifuging the wine
   E. Keeping records
   F. Tasting wine
   G. Controlling quality

VII. CELLARING THE WINE

A. Aging wine in tanks and barrels
B. Topping-up barrels
C. Testing and correcting wine
D. Blending the wine
E. Testing the wine and recording the results
F. Tasting wine
G. Controlling quality

VIII. PACKAGING THE WINE

A. Testing wine to prepare for bottling
B. Filtering prior to bottling
C. Arranging area for glass storage
D. Preparing line for bottling
E. Bottling wine
F. Closuring, capsuling, labeling and casing
G. Storing wine
H. Releasing wine for sale
I. Keeping records
J. Testing wine and recording results
K. Tasting wine
L. Controlling quality

IX. SANITIZING THE WINERY

A. Preparing winery for tourists

B. Winterizing, sanitizing and repairing equipment

C. Keeping records

X. OVERALL QUALITY CONTROL

A. Controlling quality

XI. GENERAL EVALUATION OF WINE

A. Testing wine and recording results

B. Tasting wine

XII. DEVELOPING A MARKETING SCHEME

A. Developing a distribution network

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: PLANNING MARKET STRATEGIES

Performance Steps:

1. Determine crop/product to be produced - table or wine grapes, wholesale or retail.

2. Determine varieties and management system.

3. Determine price of crop/products.

4. Determine delivery system.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: DEVELOPING BUDGETS AND DETERMINING FINANCIAL RESOURCES

Performance Steps:

1. Determine management units.
2. Determine site selection costs.
3. Determine site preparation costs.
4. Determine land costs - interest on loan.
5. Determine water well cost.
6. Explore possible financial resources.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: SELECTING VINEYARD SITE

Performance Steps:

1. Determine proper climate and microclimate for vineyard.
2. Determine proper soil for vineyard.
3. Determine water sources and quality requirements.
4. Determine accessibility.
5. Determine wet/dry laws for retail sales at winery.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: SELECTING ROOT STOCK/VARIETY

Performance Steps:

1. Select proper varieties for product to be produced.

2. Select rootstock based on disease resistance, soil requirements, vigor and cold tolerance.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: ORDERING PLANTS AND VINEYARD SUPPLIES

Performance Steps:

1. Place order with reputable/established nursery.

2. Select delivery date.

2. Select and order vineyard supplies.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: TRAINING LABOR FORCE

Performance Steps:

1. Explain vine training.
2. Explain vine pruning.
3. Explain irrigation practices.
4. Explain weed control system.
5. Develop daily and long-range labor plans.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: MAINTAINING AND OPERATING EQUIPMENT/TOOLS

Performance Steps:

1. Select adequate storage facilities.
2. Service engines.
3. Care for sprayers.
4. Care for hand tools.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: PROPAGATING PLANTS

Performance Steps:

1. Propagate by cuttings - dormant and greenwood.
2. Propagate by layerage.
3. Propagate by seed.
4. Propagate by grafting.
5. Propagate by rootstocks.
6. Select parent vines.
7. Prepare production beds.
8. Store dormant grafts/cuttings/plants.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: PREPARING LAND

Performance Steps:

1. Clear brush from land.
2. Eradicate weeds from land.
3. Cultivate soil.
4. Smooth soil for layout preparation.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: LAYING-OUT VINEYARD

Performance Steps:

1. Develop schematic drawing of vineyard.
2. Establish center row.
3. Stretch wire.
4. Mark plant sites and post sites.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: DESIGNING AND INSTALLING WATER SYSTEM

Performance Steps:

1. Determine water requirements and source.

2. Select proper system for vineyard.

3. Purchase supplies or contract job.

4. Install irrigation system.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: PLANTING THE VINEYARD

Performance Steps:

1. Purchase plants.
2. Select delivery date.
3. Store plants until planting season.
4. Prepare plants for planting.
5. Dig hole at selected spacing.
6. Place plant and stake in hole.
7. Pack soil loosely around plant and stake.

8. Water plant.

9. Pack soil firmly.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: TRAINING PLANTS

Performance Steps:

1. Select pruning system.
2. Implement the required training practices.
3. Monitor vine training seasonally and yearly.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: PLANNING FOR PEST CONTROL

Performance Steps:

1. Identify pest problem.

2. Select method of control.

3. Implement control practices.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: KEEPING WRITTEN RECORDS

Performance Steps:

1. Develop financial records system.

2. Develop management records system.

3. Develop cultural/analytical records system.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

TASK: REPLANTING VINEYARD SKIPS

Performance Steps:

1. Determine variety and number of plants required.

2. Follow task analysis in TASK: PLANTING THE VINEYARD.

CURRICULUM: VITICULTURE

DUTY: DESIGNING AND OPERATING WATER MANAGEMENT SYSTEM

TASK: MAINTAINING POWER SOURCE

Performance Steps:

1. Monitor incoming and outgoing voltage.
2. Inspect and replace appropriate fuses.
3. Operate required voltage regulators.

CURRICULUM: VITICULTURE

DUTY: MAINTAINING AND OPERATING WATER MANAGEMENT SYSTEM

TASK: MAINTAINING SUPPLY AND QUALITY

Performance Steps:

1. Inspect, clean and replace filters.
2. Lubricate and operate manual control valves.
3. Backwash filtration system.

CURRICULUM: VITICULTURE

DUTY: MAINTAINING AND OPERATING WATER MANAGEMENT SYSTEM

TASK: TESTING SOIL MOISTURE

Performance Steps:

1. Manually test by touch.

2. Utilize tensiometers for moisture readings.

3. Operate soil probes and other testing devices.

CURRICULUM: VITICULTURE

DUTY: MAINTAINING AND OPERATING WATER MANAGEMENT SYSTEM

TASK: TREATING WATER

Performance Steps:

1. Determine need for water treatment.
2. Implement appropriate treatment as required.
3. Monitor water treatment/fertilization systems.

CURRICULUM: VITICULTURE

DUTY: MAINTAINING AND OPERATING WATER MANAGEMENT SYSTEM

TASK: SCHEDULING IRRIGATION

Performance Steps:

1. Set and operate manual and automatic timers.

2. Compute operating periods based upon plant requirements and precipitation rates.

CURRICULUM: VITICULTURE

DUTY: MAINTAINING AND OPERATING WATER MANAGEMENT SYSTEM

TASK: MAINTAINING WATER SYSTEM

Performance Steps:

1. Install and repair piping systems.

2. Operate drainage systems.

3. Replace and repair emitters, sprinklers, and other application devices.

CURRICULUM: VITICULTURE

DUTY: MAINTAINING AND OPERATING WATER MANAGEMENT SYSTEM

TASK: UTILIZING WATER SYSTEM FOR PLANT/VINEYARD MANAGEMENT

Performance Steps:

1. Coordinate application and drainage with requirements of grape plant.
2. Calibrate application equipment to enhance yield.

CURRICULUM: VITICULTURE

DUTY: MAINTAINING AND OPERATING WATER MANAGEMENT SYSTEM

TASK: WINTERIZING THE SYSTEM

Performance Steps:

1. Clean and service all valves.
2. Drain water from valves and piping system.
3. Insulate and protect valves, timers, and pumps.
4. Check all working parts and replace prior to spring start-up.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE SOIL

TASK: CHECKING PLANTS FOR MINERAL DEFICIENCY

Performance Steps:

1. Identify mineral deficiency symptoms.

2. Analyze plants in a systematic manner.

3. Determine amount to satisfy deficiency.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE SOIL

TASK: TESTING SOIL AND PETIOLE

Performance Steps:

1. Determine number of samples required for analyses.
2. Collect samples.
3. Submit to laboratory for analyses.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE SOIL

TASK: APPLYING FERTILIZERS

Performance Steps:

1. Apply fertilizers, based on results of laboratory analysis.

2. Determine proper use of equipment.

3. Adhere to established safety regulations.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE SOIL

TASK: CULTIVATING THE SOIL

Performance Steps:

1. Determine the purpose for cultivating.
2. Determine type of cultivation.
3. Determine depth of cultivation.
4. Determine proper time of cultivation.
5. Select adequate equipment for the purpose of cultivating.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE SOIL

TASK: PREVENTING EROSION

Performance Steps:

1. Determine type and source of erosion.

2. Implement adequate erosion control measures.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE PLANT CANOPY

TASK: PRUNING, TRAINING AND TYING THE VINE

Performance Steps:

1. Select pruning system best suited to production system.
2. Establish and maintain the vine in a form that will save labor and facilitate vineyard operation.
3. Distribute bearing wood over the vine, among the vines, and over the years.
4. Develop a vine of desirable form.
5. Attach vine and its growth to various supports.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE PLANT CANOPY

TASK: POSITIONING THE SHOOTS

Performance Steps:

1. Position shoots in a vertical manner to open up the canopy to sunlight and air flow.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE PLANT CANOPY

TASK: THINNING LEAVES

Performance Steps:

1. Determine the degree and location of thinning needed.

2. Thin according to determined need.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE PLANT CANOPY

TASK: HEDGING THE VINES

Performance Steps:

1. Determine the degree of hedging needed.

2. Hedge according to determined need at proper time.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE PLANT CANOPY

STEPS: SUCKERING THE VINES

Performance Steps:

1. Determine need for sucker removal.

2. Remove undesired shoots that originate on the trunk and below the ground.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE PLANT CANOPY

TASK: MAINTAINING THE TRELLIS

Performance Steps:

1. Inspect trellis for needed repairs.

2. Replace worn components as needed.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE PLANT CANOPY

TASK: PROTECTING VINEYARD AFTER HARVEST

Performance Steps:

1. Spray as needed.

2. Irrigate as required.

3. Control weeds.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE PLANT CANOPY

TASK: WINTERIZING PLANTS

Performance Steps:

1. Reduce water in August and September to slow growth rate.

2. Plant cover crops to reduce vine vigor and control erosion.

3. Inspect vines for trunk and cordon damages.

CURRICULUM: VITICULTURE

DUTY: CONTROLLING PESTS

TASKS: INSPECTING FOR PESTS

Performance Steps:

1. Identify types of pest damage.

2. Recommend appropriate corrective measures.

CURRICULUM: VITICULTURE

DUTY: CONTROLLING PESTS

TASK: DETERMINING TIMING OF PREVENTION

Performance Steps:

1. Control according to pest damage.
2. Control according to established prevention schedules.

CURRICULUM: VITICULTURE

DUTY: CONTROLLING PESTS

TASKS: MAINTAINING, OPERATING AND CALIBRATING SPRAYERS

Performance Steps:

1. Clean sprayers thoroughly after each use.
2. Store sprayers for protection from climatic elements and accidental damage.
3. Provide separate sprayers for pesticides and herbicides.
4. Determine proper spray nozzles required for production system requirements.
5. Regulate sprayers as required.

CURRICULUM: VITICULTURE

DUTY: CONTROLLING PESTS

TASKS: COMPLYING WITH PESTICIDE REGULATIONS/MAINTAINING WRITTEN RECORDS

Performance Steps:

1. Adhere to established regulations.

2. Maintain records required by Texas Department of Agriculture.

CURRICULUM: VITICULTURE

DUTY: CONTROLLING PESTS

TASKS: APPLYING PRE-EMERGENT AND POST-EMERGENT HERBICIDES

Performance Steps:

1. Identify weed control problems.

2. Apply recommended herbicides for weed control.

3. Schedule applications.

CURRICULUM: VITICULTURE

DUTY: CONTROLLING PESTS

TASK: INSTALLING BIRD NETS OR BIRD CONTROL DEVICES

Performance Steps:

1. Determine bird control requirements.

2. Install bird nets.

3. Install and schedule rotation of butane cannons.

CURRICULUM: VITICULTURE

DUTY: CONTROLLING PESTS

TASKS: MAINTAINING FENCING

Performance Steps:

1. Determine fencing requirement.

2. Construct required fencing.

3. Maintain vineyard fencing.

CURRICULUM: VITICULTURE

DUTY: CONTROLLING PESTS

TASKS: SETTING GOPHER TRAPS

Performance Steps:

1. Identify gopher damage to vineyard.

2. Determine eradication methods.

CURRICULUM: VITICULTURE

DUTY: CONTROLLING PESTS

TASKS: SANITIZING THE VINEYARD/EQUIPMENT

Performance Steps:

1. Cultivate the vineyard to keep soil surface clean.
2. Remove and burn all prunings from vineyard.
3. Clean and store equipment properly.
4. Sanitize pruning equipment.

CURRICULUM: VITICULTURE

DUTY: MARKETING THE CROP

TASK: IDENTIFYING MARKET SOURCES

Performance Steps:

1. Conduct different market surveys.
2. Administer a market analysis.
3. Develop marketing information system.

CURRICULUM: VITICULTURE

DUTY: MARKETING THE CROP

TASK: NEGOTIATING CONTRACTS

Performance Steps:

1. Determine legal requirements.
2. Determine price per ton, per variety; bonus for quality; penalty for poor quality.
3. Determine method and schedule of money transfer.

CURRICULUM: VITICULTURE

DUTY: MARKETING THE CROP

TASK: DETERMINING HARVEST PARAMETERS

Performance Steps:

1. Determine degree Brix, pH, and acid requirements of winery/broker.

CURRICULUM: VITICULTURE

DUTY: MANAGING CROP LEVELS AND QUALITY

TASK: DETERMINING OPTIMUM CROP LEVELS

Performance Steps:

1. Evaluate soil, spacing, varieties, climate and water.

2. Evaluate cluster size and number per variety.

3. Evaluate shoot size and length.

4. Conduct balanced pruning.

5. Practice crop load balance.

CURRICULUM: VITICULTURE

DUTY: MANAGING CROP LEVELS AND QUALITY

TASK: PRUNING DORMANT PLANTS

Performance Steps:

1. Select appropriate pruning system based on production system.
2. Identify proper size shoots to leave as canes and spurs.
3. Determine number of buds to leave as fruiting sites.

CURRICULUM: VITICULTURE

DUTY: MANAGING CROP LEVELS AND QUALITY

TASK: THINNING CLUSTERS AND DETERMINING BUNCH POSITIONING

Performance Steps:

1. Remove excess clusters at berry set in late April.
2. Thin to balance vine vigor and fruiting load.
3. Thin to position clusters on shoots to maximize light intensity.

CURRICULUM: VITICULTURE

DUTY: MANAGING CROP LEVELS AND QUALITY

TASK: APPLYING GROWTH REGULATORS

Performance Steps:

1. Determine needed response from growth regulators.
2. Schedule application of growth regulators for determined need.

CURRICULUM: VITICULTURE

DUTY: MANAGING CROP LEVELS AND QUALITY

TASK: GIRDLING

Performance Steps:

1. Determine needed response from girdling.

2. Schedule girdling practices.

3. Cut an "S" circle around the trunk or cordon of mature vines at full bloom to speed-up harvest and improve berry size and quality.

CURRICULUM: VITICULTURE

DUTY: MANAGING CROP LEVELS AND QUALITY

TASK: SCHEDULING IRRIGATION

Performance Steps:

1. Reducing irrigation levels should not be practiced as a routine way of increasing "solids" of wine or table grapes.

CURRICULUM: VITICULTURE

DUTY: HARVESTING THE CROP

TASK: TESTING HARVEST PARAMETERS

Performance Steps:

1. Determine at what stage of maturity the crop is to be harvested.

2. Determine degree Brix, acidity, pH and Brix-acid ratio on fruit samples.

3. Maintain close communication with winery/broker regarding changes in the ripening process.

CURRICULUM: VITICULTURE

DUTY: HARVESTING THE CROP

TASK: COORDINATING WITH WINERY/BROKER

Performance Steps:

1. Determine harvest schedule based on winery/broker requirements.

2. Determine who will deliver the grapes.

3. Establish sequence for delivery of grapes.

CURRICULUM: VITICULTURE

DUTY: HARVESTING THE CROP

TASK: HIRING LABORERS

Performance Steps:

1. Determine availability of contract labor.
2. Determine pay rate basis and schedule.
3. Adhere to Federal Immigration and Naturalization Service regulations.
4. Establish adequate personnel records and provide for legal requirements.

CURRICULUM: VITICULTURE

DUTY: HARVESTING THE CROP

TASK: PREPARING HARVEST CONTAINERS, EQUIPMENT

Performance Steps:

1. Clean and sanitize harvest containers and equipment.

2. Select proper sized containers.

3. Provide additional harvest tools.

CURRICULUM: VITICULTURE

DUTY: HARVESTING THE CROP

TASK: SUPERVISING HARVEST OPERATIONS

Performance Steps:

1. Establish harvest pattern for vineyard.

2. Monitor operations constantly.

3. Provide water for cleaning tools and hands throughout the vineyard.

4. Provide adequate restroom facilities.

5. Provide drinking water and work breaks.

CURRICULUM: VITICULTURE

DUTY: HARVESTING THE CROP

TASK: APPLYING PRESERVATIVES AND PREPARING CROP FOR TRANSPORT

Performance Steps:

1. Adhere to winery/broker requirements.

CURRICULUM: VITICULTURE

DUTY: HARVESTING THE CROP

TASK: TRANSPORTING GRAPE CROP

Performance Steps:

1. Select optimum method of grape transport.
2. Estimate daily harvest maximum and minimum amounts.
3. Transport grapes as rapidly as possible to maintain freshness.

CURRICULUM: VITICULTURE

DUTY: HARVESTING THE CROP

TASK: COMPLETING CONTRACT

Performance Steps:

1. Verify agreement items in contract.
2. Determine if grower bonus/penalty is appropriate.
3. Honor payment agreement.

CURRICULUM: VITICULTURE

DUTY: HARVESTING THE CROP

TASK: REPAIRING, CLEANING AND STORING HARVEST EQUIPMENT

Performance Steps:

1. Inspect equipment for needed repairs and services.

2. Implement needed repairs and maintenance service.

3. Clean and sanitize equipment prior to storage.

CURRICULUM: VITICULTURE

DUTY: HARVESTING THE CROP

TASK: IMPLEMENTING POST-HARVEST OPERATIONS

Performance Steps:

1. Reduce water in August and September to slow growth rate.
2. Maintain vine canopy until leaf fall.
3. Inspect vines for trunk and cordon damages.
4. Spray pesticides and herbicides as needed.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: DETERMINING HARVEST DATE

Performance Steps:

1. Determine style of wine to be made.
2. Ascertain optimum chemical composition (B, pH, T.A.).
3. Determine method of sampling to be used.
4. Determine plan for sampling.
5. Select plants to be sampled.
6. Establish procedure for sampling.
7. Collect samples.
8. Prepare samples for analysis.

9. Analyze sample.

10. Record results.

11. Clean up.

12. Evaluate results.

13. Determine next action.

CURRICLULM: ENOLOGY (WHITE WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: ESTIMATING YIELDS/NEEDS

Performance Steps:

Yield - Vineyard

1. Determine plan for sampling.
2. Select plants to be sampled.
3. Establish procedure for sampling.
4. Collect data (count clusters/plant).
5. Analyze data:
    a. Estimate # clusters/vineyard.
    b. Estimate potential cluster weight.
    c. Estimate tonnage/vineyard.
    d. Estimate juice volume/vineyard.

Needs-Winery

1. Developing plan for year
2. Establish wine marketing needs.
3. Establish winemaking needs.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: PREPARING GRAPES FOR TRANSPORTING

Performance Steps:

1. Select properly-sized picking containers.

2. Clean picking containers.

3. Pick grapes by hand.

4. Store grapes in shade until ready for transport.

5. Transport with minimum crushing.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: PREPARING WINERY FOR RECEIVING GRAPES

Performance Steps:

1. Discuss winery needs with vineyard manager.
2. Evaluate with vineyard manager field sampling data and data from previous year.
3. Service all receiving equipment.
4. Test operate all equipment.
5. Train all personnel in equipment use.
6. Clean and sanitize all equipment.
7. Notify vineyard manager of ability to receive grapes.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: MANAGING RECORDS SYSTEM

Performance Steps

1. Determine what records need to be taken.
2. Determine how records are going to be processed or analyzed.
3. Determine how records are going to be recorded.
4. Prepare materials and computer.
5. Train all personnel.
6. Record data.
7. Periodically review record keeping.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: CONTROLLING QUALITY AT HARVEST

Performance Steps:

1. Attempt to pick grapes at optimum chemical compositon.
2. Have all containers clean and metal surfaces painted except stainless steel.
3. Supervise picking.
4. Control temperature of picked fruit.
5. Transport rapidly to winery.
6. Add sulfites when appropriate.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: CLEANING/SANITIZING EQUIPMENT
(Hoses, Pumps, Crusher, Press, Tanks)

Performance Steps:

Prior to Initial Use or After One Week-

1. Soak fittings, washers, etc. in sulfur dioxide solution for 1-6 hours.
2. Rinse all equipment with hot water.
3. Circulate warm citric acid, sulfur dioxide solution through all hoses and pumps.
4. Rinse all equipment with sulfur dioxide solution.
5. Rinse with hot water.
6. Air dry.
7. Rinse with hot water just prior to use.

After Recent Use-

1. Drain all hoses, pumps, etc.
2. Rinse with hot water.
3. Steam clean, where appropriate.
4. Chemically clean with citric acid and sulfur dioxide solution.
5. Rinse with hot water.
6. Air dry.
7. Rinse with hot water just prior to use.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: PREPARING COOPERAGE

Performance Steps:

Prior to First Use of Stainless Steel-

1. Rinse with hot water.
2. Circulate 10% nitric acid solution over interior surfaces for 30 minutes.
3. Rinse with hot water.
4. Rinse with soda ash solution (pH 10-11) for 15 minutes.
5. Rinse with water.
6. Air dry for 36 hours before use.

Stainless Steel After Use-

1. Rinse with hot water.

2. Clean tartrates from tank.

3. Rinse with hot water.

4. Air dry.

5. Rinse prior to use.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: TESTING AND ARRANGING EQUIPMENT

Performance Steps:

Before Operating for First Time-

1. Visually inspect all electrical connections for worn insulation, defective wiring, etc.
2. Repair any defect detected.
3. Determine that there are spare fuses for each piece of electrical equipment.
4. Check all motors to see that moving parts are free of obstructions.
5. Hand turn, if possible, all moving parts to insure that they can move.
6. Grease all grease fittings with food-grade grease.

7. Start each motor for 30 seconds or less (test operate).

8. Repair any that does not run properly.

9. Run equipment for several minutes to insure equipment will work.

10. Clean equipment and put into proper location.

After Equipment Tested-

1. Arrange equipment for best operation of winery.

2. Keep work floor as free as possible of electrical wiring and loose pieces of equipment.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: PREPARING COOLING SYSTEM

Performance Steps:

1. Determine cooling requirements for the year.

2. Run cooling system long enough to check operation.

3. Replace old cooling fluid with fluid of a type that will allow maximum desired cooling.

4. Run cooling system for 24 hours to check for leaks and operation of system.

5. Repair any leaks or other defective parts.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: ORDERING OF SUPPLIES, YEAST ENZYMES, CHEMICALS, BOTTLES

Performance Steps:

1. Maintain running inventory of winery supplies.

2. Determine minimum inventory necessary before reordering.

3. Develop tentative winemaking plan four months prior to harvest.

4. Three months prior to the actual winery need:
   a. Determine at least three sources for each product needed.

   b. Solicit competitive bidding for supplies.

   c. Place order for receipt of supplies 30 days prior to actual need.

5. Maintain supply stock 10-25 in excess of predicted needs.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: STOCKING THE LABORATORY

Performance Steps:

Prior to Testing for The Year-

1. Estimate types and numbers of different analytical tests to be performed the crush or year.

2. Determine types of apparatus and supplies needed to conduct analysis.

3. Purchase equipment and supplies.

4. Make up standard solutions.

5. Clean up laboratory.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: PREPARING THE YEAST CULTURE

Performance Steps:

Freeze Dried Active Yeast

1. Determine volume of starter needed.

2. Measure volume of water needed to start starter solution.

3. Add 0.5-1.0 percent (5-20 ml minimum) grape juice.

4. Heat mixture just to boiling.

5. Allow to cool to 100-105 degrees F.

6. Add freeze-dried active yeast at rate of 1-2 g/100 ml solution.

7. Swirl and allow to set until solution starts actively bubbling.

8. Add yeast solution to starter solution juice at room temperature. (70-75 degrees F)

9. Clean up.

Liquid Culture

1. Determine volume of starter needed.

2. Measure volume of water needed to start starter solution.

3. Add 0.5-1.0 percent (5-20 ml minimum) grape juice.

4. Heat mixture just to boiling.

5. Allow to cool to 100-105 degrees F.

6. Add 1-2 ml of liquid culture to cooled juice.

7. Allow solution to set at ambient temperature (70-75 degrees F) for 6-24 hours or until actively bubbling.

8. Add fermenting solution to juice of starter at room temperature. (70-75 degrees F)

9. Clean up.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PREPARING FOR THE CRUSH

TASK MANAGING RECORDS

Performance Steps:

1. Determine what records are needed.
2. Determine how records will be analyzed.
3. Determine how records are going to be recorded.
4. Prepare materials and computer.
5. Train all personnel.
6. Record data.
7. Periodically review record keeping.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: CONTROLLING QUALITY AT CRUSH

Performance Steps:

1. Establish standards for cleanliness and sanitation.

2. Establish back-up procedures for all crush operations.

3. Train personnel thoroughly.

4. Closely supervise all steps in crush operations.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: RECEIVING FRESH GRAPES

TASK: WEIGHING THE GRAPES

Performance Steps:

1. Determine weigh procedure.
2. Purchase or maintain scales.
3. Calibrate scales.
4. Weigh grapes.
5. Record weights.
6. Recalibrate scales periodically.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: RECEIVING FRESH GRAPES

TASK: UNLOADING THE GRAPES

Performance Steps:

1. Keep grapes in shade and as cool as possible while waiting to unload.

2. Transfer grapes from field vehicle to receiving station or bin.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: RECEIVING FRESH GRAPES

TASK: SORTING THE GRAPES

Performance Steps:

1. Inspect grapes upon arrival at receiving station.

2. Hand remove, when possible, grapes that are immature or are infected with bunch rot.

3. Hand remove, when possible, material other than grapes (MOG).

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: RECEIVING FRESH GRAPES

TASK: HOLDING/STORING THE GRAPES

Performance Steps:

1. Move grapes to storage or cooling area as soon as possible after grapes are picked.
2. Package grapes in as small containers as possible.
3. Cover surface of grapes.
4. Maintain grapes, if possible, below 40 degrees F.
5. Remove grapes from storage just prior to processing.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: RECEIVING FRESH GRAPES

TASK: KEEPING RECORDS

Performance Steps:

1. Determine what records need to be kept.

2. Determine how records are going to be analyzed.

3. Determine how records are going to be recorded.

4. Prepare materials for record keeping.

5. Train all personnel.

6. Record data.

6. Periodically review record keeping.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: RECEIVING FRESH GRAPES

TASK: CONTROLLING QUALITY

Performance Steps:

1. Minimize time from picking to storage.
2. Minimize juicing of picked grapes.
3. Maintain grape temperature from 32-40 degrees F while in storage.
4. Minimize length of storage time.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: CRUSHING AND DESTEMMING THE GRAPES

Performance Steps:

1. Clean and rinse crusher/stemmer.
2. Test operate crusher/stemmer.
3. Position container to catch stems.
4. Connect equipment to transport must from crusher/stemmer to next processing station.
5. Arrange for delivery of grapes to receiving station.
6. Receive grapes at receiving station.
7. Weigh grapes.
8. Add sulfite.

9. Crush and stem grapes at rate equal to or less than capacity of crusher/stemmer.

10. Turn off equipment when finished.

11. Clean and rinse equipment.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: ADDING OF SULFITE

Performance Steps:

1. Determine weight of grapes.
2. Determine conditon of grapes.
3. Add 70 ppm sulfur dioxide to sound, white wine grapes just prior to crushing.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: COOLING THE MUST

Performance Steps:

1. Connect must pump from crusher/stemmer to heat exchanger and heat exchanger to primary fermenter.
2. Connect cooling system to heat exchanger.
3. Start cooling system.
4. Pump must through heat exchanger.
5. Disconnect pumps and hoses when finished.
6. Clean all equipment.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: TRANSFERRING MUST TO PRIMARY FERMENTER

Performance Steps:

1. Connect must pump from crusher/stemmer or heat exchanger to primary fermenting tank.

2. Check cleanliness of lines and tanks.

3. Check to make sure tank valves are closed.

4. Set cooling for desired tank temperature.

5. Fill tank with gas.

6. Pump must.

7. Top tanks with gas.

8. Close and seal tank.

9. Allow must to set for desired length of skin contact.

10. Pump must to dejuicing screen or directly to press.

11. Clean hoses and pump.

CURRICLULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: DEJUICING

Performance Steps:

For Incline Dejuicing Screen-

1. Clean and rinse dejuicing screen before use.
2. Test operate dejuicing screen.
3. Connect hoses and pumps from dejuicing screen to press and to free run juice tank.
4. Turn on dejuicing screen.
5. Deliver grape must to dejuicing screen at rate within the capacity of the screen.
6. Start pumps.
7. Turn off equipment when finished.
8. Clean and rinse all equipment.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: TRANSFERRING MUST TO PRESS

Performance Steps:

1. Clean and rinse hoses and pumps.
2. Connect hoses and pump from dejuice to press.
3. Pump must at uniform rate to press.
4. Minimize air contact with pumped must.
5. Terminate pumping when press is filled.
6. Clean and rinse hoses and equipment.
7. Store hoses so that they air dry.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: PRESSING THE MUST

Performance Steps:

1. Clean and rinse press before use.
2. Test operate press and related equipment.
3. Prepare tanks to receive juice.
4. Connect hoses and pumps.
5. Prepare receptacle to receive pomace.
6. Transfer must to press.
7. Press must.
8. Clean equipment.

9. Air dry.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: DISPOSING OF POMACE

Performance Steps:

1. Transfer pomace via vehicle or conveyor to drying station.
2. Allow pomace to air dry for more than one month.
3. Load dry pomace on to disposal vehicle.
4. Transfer must to vineyard.
5. Spread pomace evenly within the rows of the vineyard.
6. Clean up vehicles and dry station.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: ANALYZING THE JUICE

Performance Steps:

1. Take 100 ml juice sample from each lot of juice to be analyzed.
2. Transfer samples to laboratory in closed, labeled containers.
3. Centrifuge juice sample or allow to settle.
4. Determine percent insoluble solids.
5. Measure percent Brix, percent soluble solids, or percent sugar.
6. Measure juice pH.
7. Measure titratable acidity.
8. Measure total anions.

9. Calculate cations.

10. Calculate PZ.

11. Determine needed sugar, pH, or acid adjustments.

12. Clean up.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: REMOVING INSOLUBLE SOLIDS (RACKING, CENTRIF, FILTERING)

Performance Steps:

Racking (Part I)

1. Add 5% bentonite solution at a rate of 2-3 lbs/1000 gallons as juice is pumped into tank (optional) or, add pectolitic enzymes at a rate of 40-90g per 1000 gallons.
2. Blanket juice with carbon dioxide.
3. Chill juice to below 40 degrees F.
4. Allow juice to settle for 12-24 hours.
5. Adjust racking tube to just above juice/lees interface.
6. Pump juice to fermentation tank.
7. Pump lees to "lees filter or centrifuge."

8. Clean tank.

9. Air dry.

Centrifugation (Part II)

1. Add 5% bentonite solution at a rate of 2-3 lbs/1000 gallons as juice is pumped into tank. (Optional) OR, add pectolitic enzymes at a rate of 40-80g per 1000 gallons.

2. Blanket juice with carbon dioxide.

3. Chill juice to below 40 degrees F.

4. Allow juice to settle for 12-24 hours.

5. Adjust racking tube to just above juice/lees interface.

6. Pump juice to fermenting tank.

7. Pump lees to "lees filter or centrifuge."

8. Centrifuge juice.

9. Pump clarified juice to fermenting tank.

10. Dispose of solids from centrifuge.

Filtration (Part III)

1. Add 5% bentonite solution at a rate of 2-3 lbs/1000 gallons as juice is pumped into tank. (Optional) OR, add pectolitic enzymes at a rate of 40-80g per 1000 gallons.

2. Blanket juice with carbon dioxide.

3. Chill juice to below 40 degrees F.

4. Allow juice to settle for 12-24 hours.

5. Adjust racking tube to just above juice/lees interface.

6. Pump juice to fermenting tank.

7. Pump lees to "lees filter or centrifuge."

8. Prepare filter bed of Diatomaecous Earth (DE).

9. Continually mix coarse DE with juice.

10. Pump mixture through DE bed.

11. Pump filtered juice to fermenting tank.

12. Clean up filter, pump, hoses.

13. Dispose of old or waste DE.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: ADDING OTHER AMELIORATION

Performance Steps:

Chaptalization (Sugar Addition)

1. Determine amount of sugar needed to raise sugar content to desired level.
2. Dissolve sucrose in juice.
3. Heat solution to no greater than 100 degrees F.
4. Cool the solution.
5. Add solution to juice just prior to fermentation or within the first two days of fermentation.
6. Clean up equipment and containers.

Acidification (Acid Addition)

1. Determine desired amount of pH or acid level changes.

2. Determine proper amounts of tartonic acid to be added.
3. Dissolve acid into small amount of juice.
4. Add solution to remaining juice.
5. Clean up.

Deacidification (Carbonate Addition)

1. Determine desired level of deacidification.
2. Determine levels of Calcium Carbonate or Potassium Bicarbonate needed to adjust acid levels.
3. Dissolve chosen carbonate in clarified juice.
4. Add solution to rest of clarified juice.
5. Clean up.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: ANALYZING THE JUICE (AFTER AMELIORATION)

Performance Steps:

1. Take 100 ml sample of juice that has been ameliorated.
2. Measure juice sugar level.
3. Measure juice pH.
4. Measure juice titratableacidity.
5. Compare results after amelioration with before.
6. Clean up.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: ADDING ENZYMES, YEAST

Performance Steps:

Enzymes

1. Purchase pectolitic enzyme solution.
2. Add enzyme solution at a rate of 40-80g/1000 gallons, or as directed by manufacturer, when pumping must to settling tank.
3. Clean up.

Yeasts

1. Determine yeast strain for particular wine style.
2. Prepare starter solution as described earlier.
3. Add starter solution at a rate of 2-3% by volume.
4. Clean up.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: KEEPING RECORDS

Performance Steps:

1. Determine what records need to be kept.
2. Determine how records are going to be analyzed.
3. Determine how data will be recorded.
4. Prepare materials for record keeping.
5. Train all personnel.
6. Record data.
7. Periodically review record keeping.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

TASK: CONTROLLING QUALITY

Performance Steps:

1. Minimize juice exposure to air.
2. Keep all equipment, hoses etc. clean.
3. Do NOT add any product to must, juice or wine until amounts are double checked for accuracy.
4. Clarify juice.
5. Minimize length of time from crush to start of fermentation.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: FERMENTING THE JUICE

TASK: MONITORING TEMPERATURE AND RATE OF FERMENTATION

Performance Steps:

1. Measure temperature of fermenting juice.
2. Remove sample and measure percent Brix of fermenting juice.
3. Smell and taste sample.
4. Enter each reading into FERMENTATION LOG.
5. Determine date at which fermentation should be stopped.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: FERMENTING THE JUICE

TASK: RACKING THE WINE AS REQUIRED

Performance Steps:

1. Determine if racking of fermenting wine is required.

2. If racking is required, rack wine into another tank with aeration.

3. Fill out WORK ORDER AND FERMENTATION LOG.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: FERMENTING THE JUICE

TASK: COMPLETING FERMENTATION (FRENCH STYLE)

Performance Steps:

1. Warm-up tank to normal cellar temperature when fermentation is almost complete.

2. Measure percent Brix after three days.
   If percent Brix is low, measure residual sugar.

3. Determine that wine is fermented completely.
   Rack wine.

4. Adjust SO-2 to desired level.

5. Fill out WORK ORDER, FERMENTATION RECORD, and fill out new BULK WINE INVENTORY CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: FERMENTING THE JUICE

TASK: STOPPING FERMENTATION (GERMAN STYLE)

Performance Steps:

1. Determine SO-2 dose to be added; measure out SO-2; add to tank; mix well.

2. Lower temperature to 25 degrees F.

3. After 24 hours, set up equipment to rack or DE filter the wine.

4. Process the wine and blanket "receiving tank" with nitrogen.
   Allow wine to warm to normal cellar temperature.

5. Fill out WORK ORDER, FERMENTATION RECORD, and fill out new BULK WINE INVENTORY CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: FERMENTING THE JUICE

TASK: KEEPING RECORDS

Performance Steps:

1. Fill out all records at the end of the task.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: FERMENTING THE JUICE

TASK: TESTING THE WINE AND RECORDING THE RESULTS

Performance Steps:

Most testing during this duty is the measurement of percent Brix.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: FERMENTING THE JUICE

TASK: TASTING WINE

Performance Steps:

1. Record aroma and taste of every sample on FERMENTATION LOG OR WORK ORDER.

2. Note any problems.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: FERMENTING THE JUICE

TASK: CONTROLLING QUALITY

Performance Steps:

Little oxidation problems occur during this duty.
Microbiological problems may occur during this duty.

1. Stop fermentation process at proper point for proper style (German).
2. Ferment to dryness for proper (French) style.
3. Monitor oxidation and microbiological activity.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: ADDING FINING AGENTS

Performance Steps:

1. Perform bench-top testing to determine level(s) of fining agent(s) required.
2. Determine sequence and levels to be added to wine Weigh out fining agents.
3. Add fining agent to wine; mix well; blanket with nitrogen.
4. Record all test results in LAB ANALYSIS LOG. Record all treatments on WORK ORDER and transfer data to BULK WINE INVENTORY CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: RACKING THE WINE

Performance Steps:

1. Clean up "receiving tank," pump and fittings.
2. Set up equipment.
3. Pump wine from "source tank" into "receiving tank"; control flow rate so that solids are not picked up. Special procedures may be required for bottom portion of wine.
4. Blanket with nitrogen.
5. Pump lees into "lees tank" (if using lees filter); discard sediment.
6. Clean up "source tank" and other equipment.
7. Fill out WORK ORDER and transfer information to FERMENTATION RECORD or BULK WINE INVENTORY CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: FILTERING WITH PADS

Performance Steps:

1. Clean "receiving tank" and other equipment. Install pads into filter.

2. Rinse pads by recirculating solution. Discard solution and rinse with water.

3. Pump wine with flow rates to give correct pressure.

4. If pads become clogged, shut off wine and backflush pads with warm water.

5. At completion, blanket "receiving tank" with nitrogen. Adjust SO-2 level in wine if necessary.

6. Clean up equipment.

7. Complete WORK ORDER and transfer information to FERMENTATION RECORD or BULK WINE INVENTORY CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: FILTERING WITH DE

Performance Steps:

1. Set up filter and fittings; clean "receiving tank."
2. Add DE powder to body feed tank; mix to a slurry. Precondition filter screens.
3. Adjust flow of wine and body feed rate to obtain proper filtration conditions. Adjust as necessary during the run.
4. At completion, blanket "receiving tank" with nitrogen. Adjust SO-2.
5. Clean up "source tank" and other equipment. Dispose of DE cake in proper manner.
6. Fill out WORK ORDER and transfer data to FERMENTATION LOG or to BULK WINE INVENTORY CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: STABILIZING WINE WITH COLD TEMPERATURES

Performance Steps:

1. Test wine sample for cold-stability.
2. Attach vent-only fitting to tank.
   Lower temperature to 25 degrees F.
3. Add seed crystals of potassium bitartrate.
   Mix well.*
4. Mix tank once or twice a day for four days.*
5. Test another sample for cold-stability.
   If wine fails test, repeat mixing procedure and test again in two days.*
6. When wine passes test, rack or filter wine away from tartrates.
   Allow wine to warm up to normal cellar temperature.
7. Fill out WORK ORDER and record test results in LAB ANALYSIS LOG.

*Omit Steps 3,4,5, and wait two weeks for Step 6, if desired.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: FILTERING AND CENTRIFUGING THE WINE

Performance Steps:

1. Refer to previous TASK for steps for Filtration-Pad and Filtration-DE.

2. Use centrifuge equipment/procedures according to manufacturer's specifications.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: TESTING AND CORRECTING WINE

Performance Steps:

1. Test a sample of the wine for free and total SO-2, pH, TA and AN.

2. Correct SO-2 level in wine.

3. Correct TA and pH.

4. Determine if additional adjustments or fining agents are required.

5. Record all tests and results in LAB ANALYSIS LOG; record all treatments on WORK ORDER and transfer data to BULK WINE INVENTORY CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: KEEPING RECORDS

Performance Steps:

1. Fill out all records at the end of the task.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: TESTING WINE AND RECORDING THE RESULTS

Performance Steps:

1. Conduct laboratory testing of the wine: measurement of percent Brix, pH, TA, AN, Free SO-2 and total SO-2.

2. During certain tasks, make visual observations and conduct organoleptic testing.

3. Record all tests and results into the LAB ANALYSIS LOG.

4. Record treatments on WORK ORDER AND BULK WINE INVENTORY CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: TASTING WINE

Performance Steps:

1. At each step, record aroma, taste and observations of wine on WORK ORDER.
2. Note problems found in the wine.
3. Write results of bench-top testing in LAB ANALYSIS LOG.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: CONTROLLING QUALITY

Performance Steps:

1. Use appropriate procedures to assure proper clarification of wine.

2. Monitor wine for possible oxidation problems.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CELLARING THE WINE

TASK: AGING WINE IN TANKS (GERMAN STYLE)

Performance Steps:

1. This sweet, fruity style of wine needs no aging. Wine is treated and adjusted as quickly as possible. Bottling is done as soon as the wine passes all tests.

2. Aging is simply storage at normal cellar temperature with as little air contact as possible.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CELLARING THE WINE

TASK: AGING WINE IN BARRELS (FRENCH STYLE)

Performance Steps:

1. Prepare barrels for wine - soak, repair leaks, clean, treat, stack.

2. Pump wine into barrels.
   Seat bungs well.

3. Top up after two days to compensate for temperature differences.

   (a) Place topping wine in special container.

   (b) At each barrel, remove bung, taste wine and record comments.

   (c) Fill barrel with topping wine from special container.

   (d) Replace bung and set in place tightly.

   (e) Fill out WORK ORDER.

4. Record data on WORK ORDER and on BULK WINE INVENTORY CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CELLARING THE WINE

TASK: TOPPING-UP BARRELS (FRENCH STYLE)

Performance Steps:

1. Place topping wine in special container.
2. At each barrel, remove bung, taste wine and record comments.
3. Fill barrel with topping wine from special container.
4. Replace bung and set in place tightly.
5. Fill out WORK ORDER.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CELLARING THE WINE

TASK: TESTING AND CORRECTING WINE

Performance Steps:

1. Perform tests to determine if further treatments are necessary on the wine.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CELLARING THE WINE

TASK: BLENDING THE WINE (GERMAN STYLE)

Performance Steps:

1. Select wines and juices to be blended. Test by bench-top method (if possible).
2. Pump wines and juices into blending tank.
3. Mix well.
4. Fill out WINE BLEND PROCEDURE CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CELLARING THE WINE

TASK: BLENDING THE WINE

Performance Steps:

1. Select barrels and tanks to be blended together. Test by bench-top method (if possible).

2. Pump wines and juices into blending tank.

3. Mix well.

4. Fill Out WINE BLEND PROCEDURE CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CELLARING THE WINE

TASK: KEEPING RECORDS

Performance Steps:

1. Record results of tests in LAB ANALYSIS LOG.
2. Record each treatment of wine on WORK ORDER and on BULK WINE INVENTORY CARD.
3. Record blending operation on WINE BLENDING PROCEDURE CARD.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CELLARING THE WINE

TASK: TESTING THE WINE AND RECORDING THE RESULTS

Performance Steps:

1. Complete testing of wine will be done as this duty is completed. These tests will determine when wine is ready for bottling.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CELLARING THE WINE

TASK: TASTING WINE

Performance Steps:

1. Organoleptically test component and blended wines before and after aging.

2. Record results.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CELLARING THE WINE

TASK: CONTROLLING QUALITY

Performance Steps:

1. Prevent oxidation and loss of fruitiness to maintain optimal level of quality (German style).

2. Oxidize wine in a controlled fashion and add wood character (French style).
   Wine is MATURED during the completion of this phase.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PACKAGING THE WINE

TASK: TESTING WINE TO PREPARE FOR BOTTLING

Performance Steps:

1. Check all records on the wine.
2. Recheck final wine blend for chemical analysis.
3. Recheck final wine blend for heat-stability and cold stability.
4. Repeat organoleptic testing of final wine blend.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PACKAGING THE WINE

TASK: FILTERING PRIOR TO BOTTLING

Performance Steps:

1. Filter wine using standard pad filtration procedure.

2. Measure SO-2 level; adjust if necessary.
   Mix thoroughly if SO-2 addition is made.

3. Blanket tank with nitrogen.
   Set up system to keep positive nitrogen pressure
   over tank during entire bottling operation.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PACKAGING THE WINE

TASK: ARRANGING WINERY FOR BOTTLING

Performance Steps:

1. Check fork-lift and pallet jack.
2. Clear areas for empty glass storage and bottled wine storage.
3. Move empty glass into place.
4. Move bottling supplies into place.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PACKAGING THE WINE

TASK: PREPARING LINE FOR BOTTLING

Performance Steps:

1. Check and service all components of bottling line.

2. Adjust fill level and cork depth.

3. Rinse filter pads with solution; rinse with warm water.

4. Sterilize the "final section" (Millipore filter to filter) with hot water.

5. Aseptically remove all possible water residue.

CURRICULUM: ENOLOGY (WHITE WINES)

DUTY: PACKAGING THE WINE

TASK: BOTTLING WINE

Performance Steps:

1. Instruct each crew member regarding his/her job in the operation.
2. Start bottling operation.
3. Check fill level.
   Check cork depth.
4. Pull samples for laboratory testing.
   Date and time of day should be placed on sample.
5. Pull samples for library.
6. Check flow rate and pressure; adjust if necessary.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PACKAGING THE WINE

TASK: CLOSURING, CAPSULING, LABELING, AND CASING
With some equipment, these steps may be an integral part of the bottling operation.

Performance Steps

1. Check capsuler and spinner (or heat tunnel).

2. Check label placement on bottle.
   Check label placement on core.

3. Check casing of bottled wine.
   Check stacking of cases on pallet.
   Keep pallets properly placed.

4. Fill out DAILY BOTTLING RECORD and complete BULK WINE INVENTORY card.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PACKAGING THE WINE

TASK: STORING WINE

Performance Steps:

1. Move case goods into warehouse.

2. Check temperature in warehouse on a regular basis.

3. Fill out records to show movement of core goods.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PACKAGING THE WINE

TASK: RELEASING WINE FOR SALE

Performance Steps:

1. Check supply of bottled goods in tax-paid room. Restock from warehouse if necessary.
2. Fill invoice orders with stock from warehouse.
3. Complete all records when job is completed.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PACKAGING THE WINE

TASK: KEEPING RECORDS

Performance Steps:

1. At the end of each month, perform an inventory of bulk wine; record data in PHYSICAL INVENTORY - BULK WINE IN LITERS.

2. At the end of each month, perform an inventory of core goods, record data in PHYSICAL INVENTORY - CORE GOODS.

3. Check DAILY BOTTLING RECORD against inventory and bulk wine.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PACKAGING THE WINE

TASK: TESTING WINE AND RECORDING RESULTS

Performance Steps:

1. Test samples pulled from bottling line for microbiological stability.

2. Perform heat-stability and cold-stability tests on selected samples of bottled wine.

3. Record results of tests on LAB ANALYSIS LOG and DAILY BOTTLING RECORD.

CURRICULUM: ENOLOGY (WHITE WINES)

DUTY: PACKAGING THE WINE

TASK: TASTING WINE

Performance Steps:

1. Tasting should determine when each wine is recovered from "bottle sickness" or aged enough to be released for sale.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PACKAGING THE WINE

TASK: CONTROLLING QUALITY

Performance Steps:

This duty prepares wine for a final check by the consumer. The wine itself should be ready for the consumer to enjoy. The package should be ready for close inspection by the consumer.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PERFORMING OFF-SEASON DUTIES

TASK: PREPARING WINERY FOR TOURISTS

Performance Steps:

1. Clean and sanitize each piece of equipment.

2. Store equipment in out-of-season location.

3. Continue to check on bulk wines.

4. Conduct winery tours.
   Survey customer taste perferences in the tasting room.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: SANITIZING THE EQUIPMENT

TASK: WINTERIZING, SANITIZING AND REPAIRING EQUIPMENT

Performance Steps:

1. Perform routine maintenance on pumps, seals, fittings, hoses, and other equipment.
2. Check cooling system.
   Perform necessary repairs and maintenance.
3. Check empty tanks.
   Repair or modify as necessary.
4. Inventory all winemaking supplies.
   Update INVENTORY OF SUPPLIES.
5. Order winemaking supplies required for the coming season.
   Update INVENTORY OF SUPPLIES as each item arrives.
6. Perform modifications of equipment or addition of new equipment during this time.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: SANITIZING THE EQUIPMENT

TASK: KEEPING RECORDS

Performance Steps:

1. Check all WORK ORDERS.
   Complete and correct if necessary.
   Transfer information to other files, if necessary.
   File the WORK ORDER.

2. Check each FERMENTATION LOG; file.

3. Check each BULK WINE INVENTORY CARD; file.

4. Check each WINE BLEND PROCEDURE CARD; file.

5. Check each DAILY BOTTLING RECORD CARD; file.

6. Check PHYSICAL INVENTORY records.

7. Compile all information into the permanent ANNUAL FILE.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: SANITIZING THE EQUIPMENT

TASK: TESTING WINE AND RECORDING RESULTS

Performance Steps:

Testing of wine at this stage should determine that wine is stable. If problems arise, corrective action must be taken.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: SANITIZING THE EQUIPMENT

TASK: TASTING WINE

Performance Steps:

Tasting should describe the development (and decline) of each wine during bottle aging. This information should be used in sales.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: SANITIZING THE EQUIPMENT

TASK: CONTROLLING QUALITY

Performance Steps:

Review entire winery operation. Consider the following changes to improve efficiency:

1. Better grower relations and improvements in fruit quality.
2. Modification of production procedures.
3. Changing styles of wine to better fit market.
4. Different record-keeping methods.
5. More profitable operation of the business.
6. Incorporating innovations which appear in the wine industry.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: SAMPLING THE FIELD

Performance Steps:

1. Determine which field sampling technique will provide a representative fruit sample.

2. Determine veraison.

3. Collect grape samples from the vineyard FREQUENTLY (2 or 3 days).
   -Label sample bags.

   -Sample randomly using representative vines

   -Take sample to lab.

   -Crush berries.

   -Check percent Brix.

-Check pH.

-Check acidity.

-Monitor disease, insect, bird damage, etc.

4. Project next sampling date, and use data collected to project HARVEST DATE.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: ESTIMATING YIELDS/NEEDS

Performance Steps:

1. Determine winery capacity/needs.

2. Develop sampling methods to give accurate yield estimates for each cultivar and vineyard.

   A. Early Estimate

   -Select 10 to 20 vines randomly in each vineyard (depending on uniformity).

   -After shatter, count all clusters and determine average number of berries per cluster.

   With the above information and based on the history of accuracy for past vineyard estimates, make an early yield estimate.

   B. Final Yield Estimate at Veraison

   -Cut every cluster off the sample vines.

   -Weigh and calculate the expected tonnage by (1) determining the number of clusters of each cultivar that it takes to make 1 ton of grapes (17 to 26 clusters/vine/ton), (2) Total number of clusters/vine, (3) total number of vines/acre.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: HARVESTING

Performance Steps:

1. Mechanical Harvest
   -Prepare vineyard for mechanical harvesting. (Stop cultivation, mow, repair any trellis problems, etc.)

   -Train crew to operate mechanical harvester.

   -Select proper rpm and ground speed for each cultivar and vineyard.

   -Service and adjust mechanical harvester.

   -Clean harvester every 8 hours with high pressure washer using detergent water.

2. Harvest by hand:
   -Arrange for picking labor.

   -Train pickers.

   -Train transport crew.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: SCHEDULING RECEIVING OF GRAPES

Performance Steps:

1. Communicate with vineyard manager:
   -Schedule labor force for harvest, transportation of grapes and winery crew.

   -Coordinate harvest crew with winery capacity.

   -Transport grapes from vineyard to winery.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: PREPARING GRAPES FOR TRANSPORTING

Performance Steps:

1. Make sure there are adequate containers and transport equipment.

2. Clean containers.

3. Prepare SO-2 solution and applicator if mechanical harvesting is being used.

4. Cover transport containers if weather conditions require (rain, dust, etc.) and TRANSPORT QUICKLY. Avoid sitting in direct sunlight.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: KEEPING RECORDS

Performance Steps:

1. Keep records relative to the progress of percent Brix, pH, T.A. during maturation.

2. Record all vineyard sprays and/ or require growers to record sprays. Record damaged fruit (bird, insect, rot, MOG, etc.)

3. Record weight, source and condition of fruit (when harvested, how picked).

4. Record yield estimates, harvest parameters estimates.

5. Maintain labor records.
    -W-2; W-4

    -Time sheets

    -Green cards

6. Keep weather records.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: COORDINATING HARVEST SCHEDULE

TASK: CONTROLLING QUALITY

Performance Steps:

1. Make sure grower contract requires adequate control of insects, diseases, needs and adequate control of soil moisture, crop load, etc.

2. Receive grapes at their optimum quality level.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: CLEANING/SANITIZING OF EQUIPMENT (Hoses, Pumps, Crusher, Press, Tanks)

Performance Steps:

1. Determine standards that must be established for cleaning/sanitizing.

2. Clean and sanitize all equipment:
   -Disassemble.

   -Clean.

   -Assemble.

3. Run a "dry run" of water through entire process at critical intervals; collect water sample and analyze the sample for contaminants and residues.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PREPARING FOR THE CRUSH

TASK TESTING AND ARRANGING EQUIPMENT

Performance Steps:

1. Arrange equipment in appropriate order for use in red wine processing.

2. Make test run with all equipment using water to check for leaks in pumps, hoses, connections, etc.

3. Train winery workers on proper use of all equipment.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: PREPARING COOPERAGE

Performance Steps:

1. Soak and check all wooden barrels and vats for leaks. Make sure sufficient quanity of sound cooperage is available.

2. Clean barrels with caustic solution.

3. Rinse the soak barrels with SO-2 and citric acid solution until they are put into use.

4. Rinse well before using.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PREPARING FOR CRUSH

TASK: PREPARING COOLING SYSTEM

Performance Steps:

1. Determine if equipment is properly sized for cooling required and if the system has any leaks.

2. Fix leaks and repair equipment if required.

3. Recharge system and make a test run:
   -Check glychol/water ratio.

   -Check freon if used.

   -Check ammonia if used.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: ORDERING OF SUPPLIES (Yeast, Enzymes, Chemical, Bottles)

Performance Steps:

1. Take inventory of existing supplies.

2. Order supplies:
   -yeasts, yeast nutrients, enzymes, reagents, sanitizers, disinfectants, detergents, fining agents, antifoam agents, sugars, acids, SO-2, dextrose tablets, molo lactic bacteria, bottles, corks, labels boxes, etc.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: RESTOCKING THE LABORATORY

Performance Steps:

1. List laboratory equipment and supplies needed:

   -Make sure all equipment works.

   -Make sure existing supplies are still good.

2. Order and store all needed equipment and supplies that budget will allow!

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: STARTING THE YEAST CULTURE

Performance Steps:

1. Calculate amount of dry yeast needed to inoculate must - approximately 2.2 lbs /1000 gal.

2. Rehydrate in 5-10 volume of sterile H2-O at 40 degrees C. (Allow yeast to reach room temperature before placing in 40 degree C water.)

3. Adjust water to pH 3.3-3.8 with phosphoric acid and add 5% sugar.

4. Allow yeast to sit 10 minutes in water and add to starter tank.
   (Temperature of the yeast should equal temperature of the starter.)

5. Propagate the yeast at 25 to 35 degrees C while sparging with air.
   Check culture for cell count and purity.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: KEEPING RECORDS

Performance Steps:

1. Record supplies ordered.
2. Record barrel sanitation records and cleaning procedure.
3. Record lab supplies, equipment and reagents ordered.
4. Record yeast rehydration process.
5. Record orders received. Make notes as to quality of products and reagents, and prices.

CURRICULUM: ENOLGOY (RED WINE)

DUTY: PREPARING FOR THE CRUSH

TASK: CONTROLLING QUALITY

Performance Steps:

1. Maintain equipment in working order; clean and sanitize.

2. Check bacteria count on equipment, in the cellar, and in cooperage. (Sample all critical points of equipment and perform assays.)

3. Keep a good working stock of pure yeast starter strains through period transfers if yeast is not maintained in a dry form.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: RECEIVING FRESH GRAPES

TASK: WEIGHING THE GRAPES

Performance Steps:

1. Check scales for accuracy using heavy items of known weight. (If scales are for trade, they must be certified by the state government.)

2. Place each gondola on the scale and mark its weight on each. (Total weight - gondola weight = weight of grapes)

3. Take a representative sample of the grapes in each bin or gondola and run analysis.

4. Weigh grapes.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: RECEIVING FRESH GRAPES

TASK: UNLOADING AND SORTING THE GRAPES

Performance Steps:

1. Inspect grapes and evaluate conditon-MOG, rot, etc.

2. Sort hand-harvested grapes that are delivered in lugs.
   (Cannot sort machine harvested grapes)
   Dump grapes from lugs, bins, or gondolas into pit or stemmer-crusher.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: RECEIVING FRESH GRAPES

TASK: HOLDING/STORING THE GRAPES

Performance Steps:

1. Avoid holding grapes in direct sunlight on hot days.
2. Store grapes in a refrigerated cold storage room. (This will most likely not be cost effective for most RED wine grapes.)
3. Apply SO-2 to containers if quality is poor, if grape temperature is excessively high, and if holding period is extended.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: RECEIVING FRESH GRAPES

TASK: KEEPING RECORDS

Performance Steps:

1. Record origin, weight, cultivar and condition of each load of grapes.
2. Record amount of SO-2 applied to the grapes.
3. Record holding time and temperature.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: RECEIVING FRESH GRAPES

TASK: CONTROLLING QUALITY

Performance Steps:

1. Organize an orderly flow of grapes from harvest to crush. (If this is not possible, implement action discussed in TASK "Holding/Storing.")

2. Avoid vineyards where distance can be a problem.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PROCESSING OF GRAPES

TASK: CRUSHING AND DESTEMMING GRAPES

Performance Steps:

1. Properly adjust crusher rollers so that seeds will not be crushed, adjust speed of machine.

2. Dump grapes into dump bin with conveyor and provide a steady flow of grapes into the stemmer-crusher.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PROCESSING OF GRAPES

TASK: ADDING OF SULFITE

Performance Steps:

1. Add SO-2 at crush.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PROCESSING OF GRAPES

TASK: TRANSFERRING MUST TO PRIMARY FERMENTER

Performance Steps:

1. Sanitize connections and make sure tank, hoses, pump and hook-up system are clean.

2. Pump must into tank for primary fermentation.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PROCESSING OF GRAPES

TASKS: ANALYZING MUST

Performance Steps:

1. Sample the must at RANDOM times during the crush.

2. Run must analysis:
   - pH
   - TA
   - percent Brix
   - alcohol
   - phenolics
   - color
   - temperature of must

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PROCESSING OF GRAPES

TASK: ADDING ENZYMES AND YEAST

Performance Steps:

1. Add enzyme at stemmer-crusher or as soon as must is pumped to primary fermentator.

2. ADD YEAST. - (See DUTY section on "Preparing for the Crush"; TASK: "Restarting the Yeast Culture")

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PROCESSING OF GRAPES

TASK: ADDING OTHER AMELIORATION

Performance Steps:

1. Add sugar, acid, water, grape juice at whatever rate is necessary to produce a perfectly balanced must.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PROCESSING OF GRAPES

TASK: KEEPING RECORDS

Performance Steps:

1. Record must analysis, amount of sulfite added, amount and time of yeast and enzyme addition, and amount and time of addition of all other amelioration (sugar, acid, water, grape juice, etc.).

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PROCESSING OF GRAPES

TASK: CONTROLLING QUALITY

Performance Steps:

1. Monitor and keep all processes clean.
2. Use only a pure yeast culture.
3. Ameliorate only with high quality, pure ingredients.
4. Closely supervise the addition of SO-2, yeast, enzyme and other amelioration.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: PREPARING MALO-LACTIC FERMENTATION

Performance Steps:

Eight steps are required for preparing a 25 gram packet of lypholized leuconostoc oenos made from pure strains of PSU-1, Peynaud NCDO 1707, Radler No. 3, etc:

1. Keep M/L culture refrigerated until ready for use.

2. Mix 5 liters of sterile grape juice with 5 liters of water and adjust pH to 4.5 with Acidex or Caco 3.

3. Rehydrate 25 gm. pachet contents in 500 ml. lukewarm (20-25 degrees C) water. Mix with diluted juice from Step 2.

4. Hold mixture at approximately 20 degrees C (68 degrees F) for 48 hours.

5. Pour 10 liter culture solution into active fermenting must: (Ideally, the must has 15 to 20 percent Brix and has gone anaerobic at the time the M/L culture is added.)

   -Under ideal conditions add 10L to 2,000 gallons.

   -Under difficult conditions add to 500 gallons.

   -Under unusual conditions add to 1,000 gallons.

6. Follow progress of M/L fermentation with M/L test kit.

7. When malic acid to lactic acid conversion is approximately 75 % complete this fermenting must may be expanded into other must or wine.

   -Under ideal conditions expand 10 times. (2,000 gallons to 20,000 gallons)

   -Under difficult conditions expand 3 times.

   -Under usual conditions expand 5 times.

8. Check progress of M/L fermentation with test kit.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: BREAKING UP THE CAP

Performance Steps:

1. Breakup the "cap" by pumping the juice over the "cap." (The skins and stems are brought to the surface.)

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: MONITORING THE FERMENTATION

Performance Steps:

1. Monitor yeast population.

2. Monitor other microorganism.

3. Check record and control temperature, color extraction, alcohol content, residual sugar, etc.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: INOCULATING WITH MALO-LACTIC BACTERIA

Performance Steps:

1. Prepare M/L inoculum and inoculate with M/L culture IF DESIRED and the wine chemistry indicates a need for M/L fermentation.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: PRESSING THE WINE

Performance Steps:

1. Drain must.

2. Add pressing aid if desired and PRESS.

3. Run analysis of each lot of wine.

4. Make necessary adjustment to the wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: TRANSFERING TO SECONDARY FERMENTER AND MONITORING RESIDUAL SUGARS

Performance Steps:

1. Pump wine to a secondary fermentation tank.

2. Monitor reducing sugar level.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: DISPOSING OF POMACE

Performance Steps:

1. Pump and dispose of the press cake.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: MONITORING TEMPERATURE AND RATE OF FERMENTATION

Performance Steps:

1. Measure temperature.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: RESTARTING STUCK FERMENTATION

Performance Steps:

1. Determine course of the stuck fermentation.

2. Bring another fermentor of the same type wine to a vigorous fermentation and add 10% of the stuck wine daily or add 10-20% of an actively fermenting pure yeast starter.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: STOPPING FERMENTATION

Performance Steps:

1. Drop temperature to 28 degrees F.

2. Rack and rough filter.

3. Sterilize filter media.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: TASTING WINE

Performance Steps:

1. Record sensory trails.

2. Blend to get desired taste.

3. Make any other legal adjustment that will improve wine quality.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: KEEPING RECORDS

Performance Steps:

1. Record all aspects of the fermentation process.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

TASK: CONTROLLING QUALITY

Performance Steps:

1. Maintain a controlled/fermentation.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: RACKING WINE AS REQUIRED

Performance Steps:

1. Rack wine frequently to prevent undesirable microdimates from forming at the bottom of tank.

2. Agitate wine daily for production in the "Surlees" style.

3. Perform a complete analysis of the wine following racking.

4. Taste wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CLARIFYING THE STILL WINE

DUTY: FILTERING AND DISPOSING OF LEES

Performance Steps:

1. Filter wine:
    a. Filter wine with a DE filter.

    b. Filter wine with a polishing filter.

2. Filter lees through a lees press or filter.

3. Dispose of lees into vineyard.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: STABILIZING WINE WITH COLD TEMPERATURES

Performance Steps:

1. Drop temperature of wine to 28 degrees F for one to two weeks or until stable, or-

2. Seed wine with tartrates and refrigerate for immediate formation of tartrate crystals.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: FINING AND FILTERING/CENTRIFUGING THE WINE

Performance Steps:

1. Run fining test to determine if the wine will require fining and determine what type of fining agent will be needed.

2. Fine wine and filter - may only need to filter.

3. Conduct taste tests and laboratory analysis of final product.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: KEEPING RECORDS

Performance Steps:

1. Record when racking was first carried out.
2. Record when tanks were topped-up following racking.
3. Maintain adequate records and disposal of wine lees.
4. Record how stabilization treatments were conducted.
5. Record fining agents used, rates, and their effect on quality.
6. Record all taste evaluations.
7. Record all blending.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: TASTING WINE

Performance Steps:

1. BREAK WINE TASTING DOWN INTO FIVE BASIC STEPS:
   a. Evaluate color.

   b. Swirl wine.

   c. Smell wine.

   d. Taste wine.

   e. Savor wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CLARIFYING THE STILL WINE

TASK: CONTROLLING QUALITY

Performance Steps:

1. Monitor all operations associated with clarifying the still wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CELLARING THE WINE

TASK: AGING WINE IN TANKS AND BARRELS

Performance Steps:

1. Transfer wine to clean tanks with oak chips or to clean 55-gallon oak barrels.

2. Age big VITIS VINIFERA reds in barrels made from Never and Limosin oak for 1-3 years.

3. Open the cask each month and sample the wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CELLARING THE WINE

TASK: TOPPING-UP BARRELS

Performance Steps:

1. Top-up barrels.
2. Perform sensory exam at each topping.
3. Rack the wine off the lees and settlement twice a year; adjust free SO-2 to 25 ppm and return to clean barrels.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CELLARING THE WINE

TASK: TESTING AND CORRECTING WINE

Performance Steps:

1. Examine wine for microbiological stability at each monthly topping-up.

2. Re-analyze the wine for stability, for SO-2 content (free and bound), acid, pH, color, V.A., etc.

3. TASTE WINE:
   a. Evaluate color.

   b. Swirl wine.

   c. Smell wine.

   d. Taste wine.

   e. Savor wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CELLARING THE WINE

TASK: BLENDING THE WINE

Performance Steps:

1. Taste wine samples to see if blending with previous vintages or other lots of wine will be required to produce an acceptable flavor and character.

2. Determine lots to be blended.

3. Blend wine.

4. Analyze wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CELLARING THE WINE

TASK: TESTING THE WINE AND RECORDING THE RESULTS

Performance Steps:

1. Test the wine and KEEP ACCURATE RECORDS throughout the entire operation and on the final blend. (Note the many times this point is mentioned throughout the entire wine-making process.)

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CELLARING THE WINE

TASK: TASTING WINE

Performance Steps:

1. TASTE WINE:
    - a. Evaluate color.
    - b. Swirl wine.
    - c. Smell wine.
    - d. Taste wine.
    - e. Savor wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CELLARING THE WINE

TASK: CONTROLLING QUALITY

Performance Steps:

1. Monitor very closely all operations associated with the cellaring and aging of the wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: TESTING WINE TO PREPARE FOR BOTTLING

Performance Steps:

1. Perform final taste test of blended wine.
2. Perform final chemical analysis on wine to be bottled.
3. Add sulfite.
4. Add sweetener and sorbate. (This step is not usually taken with most red wines.)

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: FILTERING PRIOR TO BOTTLING

Performance Steps:

1. Sterilize filter prior to bottling.

2. Test for yeast cells in filtered wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: ARRANGING AREA FOR GLASS STORAGE

Performance Steps:

1. Arrange for a clean, dry, dust-free area to store glass.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: PREPARING LINE FOR BOTTLING

Performance Steps:

1. Make sure that the bottling line and especially the filling machine is clean: (Don't contaminate the wine at this step.)

   -Disassemble

   -Clean

   -Reassemble

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: BOTTLING WINE

Performance Steps:

1. Select appropriate bottle for the wine.

2. Fill bottles.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: CLOSURING, CAPSULING, LABELING AND CASING

Performance Steps:

1. Select corks to use.
2. Select the appropriate capsule.
3. Run bottles through the corking and capsuling machinery.
4. Select a design artist to draw up label and obtain BATF approval.
5. Label the wine bottles.
6. Case the wine.
7. Properly seal and label each case.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: STORING WINE

Performance Steps:

1. Store wine in an appropriate cellar or warehouse temperature for the appropriate time.

2. Keep accurate inventory of wine in warehouse.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: TESTING WINE AND RECORDING RESULTS

Performance Steps:

1. Test wine at intervals after bottling to observe for changes.
2. Record the results of taste test.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: TASTING WINE

Performance Steps:

1. Taste the wine at bi-monthly intervals to observe any changes.

2. Record the results.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: RELEASING WINE FOR SALE

Performance Steps:

1. Release the wine for sale.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: KEEPING RECORDS

Performance Steps:

1. Keep records of all operations and steps taken during the packaging and storage of the wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

TASK: CONTROLLING QUALITY

Performance Steps:

1. Monitor closely all steps of packaging, storing and releasing the wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: SANITIZING THE WINERY

TASK: PREPARING WINERY FOR TOURISTS

Performance Steps:

1. Wash down all floors, walls, equipment, etc. with hot, pressurized water and sanitizers.
2. Organize for tourists.
3. Arrange tours so that tourists do not interfere with, but observe, the crushing, processing, cellaring, and bottling operations.
4. Make winery picturesque (landscaping), and plan demonstrations, winefest, tastings, etc.
5. Consider a restaurant associated with the winery. Always stress that wine is a food and which wines compliment which foods (food and wine pairing).

6. Arrange picnic tables. (If no restaurant is planned, arrange food and wine paring luncheons.)

7. Arrange for appropriate souvenirs for tourists (t-shirts, glasses, grape jewelry, cork screws, etc.).

CURRICULUM: ENOLOGY (RED WINE)

DUTY: SANITIZING THE WINERY

TASK: WINTERIZING, SANITIZING AND REPAIRING EQUIPMENT

Performance Steps:

1. Repair worn or broken equipment.

2. Paint all equipment that can be painted.
   Oil and service all equipment.

3. Sanitize all equipment, floors, drains, etc.

4. Winterize winery and equipment.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: SANITIZING THE WINERY

TASK: KEEPING RECORDS

Performance Steps:

1. Keep bottling and warehouse records (so that correct wine can be found).

2. Keep case-goods inventory for tax paid room.

3. Keep tax paid room log.

4. Keep BATF correspondence and record of all forms with BATF.

5. Record addition of any wine spirits.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: OVERALL QUALITY CONTROL

TASK: MONITORING CONTINUOUSLY

Performance Steps:

Controlling quality is a continuous operation and involves all phases of winemaking. The following responsibilities or steps are required:

1. Inspect all supplies and materials.
2. Inspect all grapes (before and after crush).
3. Schedule the timing of all production operations.
4. Measure production efficiency and controls.
5. Measure equipment efficiency.
6. Inspect the finished wine.
7. Inspect the wine during cellaring and aging.

8. Inspect the blended wine.

9. Inspect bottled wine.

10. Maintain warehouse controls.

11. Maintain shipping, sales and storage controls.

12. Prepare specifications and Q.C. procedures in a written handbook.

Prepare statistical procedures and schedules.

14. Prepare and conduct sanitation inspections.

15. Make Q.C. standards conform to local and federal regulations.

16. Control waste disposal.

17. Use Q.C. as a basis for pricing, inventory policy, budget policy, and for evaluating individual performances.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: GENERAL EVALUATION OF WINE

TASK: TESTING WINE AND RECORDING RESULTS

Performance Steps:

1. Determine sugar levels.

2. Determine total acidity.

3. Determine pH.

4. Determine sulphur dioxide (SO-2).

5. Determine alcohol content of wine.

6. Determine the volatile acidity.

7. Detect malo-lactic fermentation.

8. Determine total soluble solids (extract in wine).

9. Determine chemical stability in the wine.

10. Determine microbial stabilizer in the wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: GENERAL EVALUATION OF WINE

TASK: TASTING WINE

Performance Steps:

The art of winemaking is difficult to describe and envolves the ability to use sensory abilities to compliment technical expertise. To evaluate a wine, these senses are used - (1) sight, (2) smell, and (3) taste. Steps to properly use these are as follows:

1. Evaluate color and clarity of wine.

2. Evaluate smell of wine.

3. Evaluate taste of wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: DEVELOPING A MARKETING SCHEME

TASK: DEVELOPING A DISTRIBUTION NETWORK

Performance Steps:

1. Identify target market or markets.
2. Make labels that will appeal to the targeted markets.
3. Develop advertisements that will appeal to targeted markets (TV, magazines, newspaper ads, pamphlets, winery newsletter, etc.).
4. Set up an efficient distribution network to effectively reach customers.
5. Learn new ideas for improving and tailoring wine to customers.

CURRICULUM: VITICULTURE

DUTY: ESTABLISHING THE VINEYARD

Performance Objectives:

1. Analyze market requirements to determine grape varieties, management system, projected prices, and type of delivery system needed.
2. Develop a budget to incorporate necessary expenditures and investigate potential sources of financial assistance.
3. Select a suitable site.
4. Choose appropriate varieties and rootstock.
5. Order plants and supplies from reputable nursery.
6. Train labor force to maintain vineyard.
7. Use proper maintenance practices and storage facilities for equipment /tools.

8. Use various methods of propagation relative to requirements.

9. Prepare the land for vineyard site.

10. Lay out the vineyard according to schematic plan.

11. Design and install adequate irrigation system.

12. Prepare and plant vines.

13. Train plants as required for specific varieties.

14. Determine potential pest problems and select/use appropriate methods of control.

15. Determine record-keeping requirements and establish adequate systems.

16. Replant vineyard skips.

CURRICULUM: VITICULTURE

DUTY: MAINTAINING AND OPERATING WATER MANAGEMENT SYSTEM

Performance Objectives:

1. Maintain power source.
2. Use proper procedures to ensure an adequate water supply of high quality.
3. Use various methods and devices to test soil moisture.
4. Make periodic changes to water treatment system as required.
5. Determine water needs and set system accordingly.
6. Use proper procedures to operate and maintain optimal water system.
7. Use water system for miximum yield.
8. Winterize the system by servicing and protecting all parts.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE SOIL

Performance Objectives:

1. Inspect plants for mineral deficiency symptoms.
2. Collect required soil and petiole samples and submit to laboratory for analyses.
3. Use proper equipment and safety procedures to apply required fertilizers.
4. Use appropriate cultivating practices and equipment.
5. Select and implement proper erosion-control measures.

CURRICULUM: VITICULTURE

DUTY: MANAGING THE PLANT CANOPY

Performance Objectives:

1. Select, establish, and maintain appropriate pruning and training.
2. Position shoots for optimal exposure to sunlight and air.
3. Use correct procedures to thin leaves as needed.
4. Hedge the vines according to determined time and need.
5. Remove undesired shoots.
6. Inspect, repair, and maintain trellis.
7. Continue clutural and maintenance practices after harvest.
8. Use suitable practices to winterize plants.

CURRICULUM: VITICULTURE

DUTY: CONTROLLING PESTS

Performance Objectives:

1. Determine type and degree of pest damage and recommend corrective measures.
2. Develop prevention schedule.
3. Use proper procedures to regulate, operate, and maintain sprayers.
4. Comply with pesticide regulations and maintain required records.
5. Determine weed control problems and use recommended herbicides on a timely basis.
6. Use suitable nets and devices to control birds.
7. Ascertain fencing requirements; construct and maintain fencing.

8. Determine extent of gopher damage and employ proper eradication methods.

9. Clean and sanitize the vineyard and equipment.

CURRICULUM: VITICULTURE

DUTY: MARKETING THE CROP

Performance Objectives:

1. Survey and analyze market sources; develop marketing information system.

2. Negotiate contracts with winery.

3. Ascertain optimal fruit ripeness for harvest.

CURRICULUM: VITICULTURE

DUTY: MANAGING CROP LEVELS AND QUALITY

Performance Objectives:

1. Evaluate numerous factors which determine optimum crop levels.

2. Select and implement appropriate pruning system when vines are dormant.

3. Thin and position clusters to maximize crop level and quality.

4. Apply growth regulators according to determined time and need.

5. Determine and schedule girdling needs and practices.

6. Practice caution in reducing irrigation levels to increase crop load.

CURRICULUM: VITICULTURE

DUTY: HARVESTING THE CROP

Performance Objective:

1. Make frequent tests of fruit samples to determine crop readiness for harvest.
2. Coordinate harvest schedule with winery/broker.
3. Determine pay rate basis for laborers and hire labor force. Adhere closely to immigration-naturalization laws and maintain detailed personnel records.
4. Prepare harvest equipment/tools and proper sized containers.
5. Provide close supervision or harvest operations.
6. Apply preservatives and prepare crop for transport according to requirements.
7. Use appropriate transportation method to maintain maximum fruit quality.

8. Make payment according to contract.

9. Inspect, repair, clean and store harvest equipment.

10. Implement post-harvest operations to maintain a healthy vineyard.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: COORDINATING HARVEST SCHEDULE

Performance Objectives:

1. Sample and analyze grape must to determine optimal harvest date.
2. Determine the yield potential and winemaking needs of the winery.
3. Prepare and transport grapes to winery for processing.
4. Prepare winery equipment and train personnel in equipment use prior to receiving grapes.
5. Determine appropriate production, financial, and regulatory information to maintain a comprehensive records system.
6. Use appropriate procedures to maintain an optimal level of grape quality.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PREPARING FOR THE CRUSH

Performance Objectives:

1. Use proper procedures to clean and sanitize winery equipment.
2. Use proper procedures to clean and sanitize all wine storage tanks and barrels.
3. Prepare, test and arrange winery equipment for crushing.
4. Prepare, test, and repair cooling equipment of tanks and the winery facility.
5. Maintain an adequate inventory of winery supplies.
6. Provide laboratory equipment and supplies necessary for laboratory test analyses.

7. Determine appropriate production, financial and regulatory information to maintain a comprehensive records system.

8. Use suitable procedures to assure quality throughout the crushing phase.

9. Use proper procedures to prepare yeast starter solution.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: RECEIVING FRESH GRAPES

Performance Objectives:

1. Weigh grapes according to the selected weigh procedures.

2. Use appropriate method of transferring grapes to receiving station.

3. After inspection, remove undesirable grapes.

4. Use proper procedures for holding/storing grapes.

5. Determine data necessary to maintain a comprehensive record-keeping system.

6. Maintain optimal quality of grapes by minimizing storage time/juicing and maintaining proper temperature.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PROCESSING OF GRAPES

Performance Objectives:

1. Crush and destem grapes as dictated by selected wine style.

2. Determine sulfite requirements and apply to grapes.

3. Using proper equipment and techniques, cool the must to desired fermenting temperature.

4. Transfer must to primary fermenter for skin contact.

5. Dejuice grape must for clarifying.

6. Transfer must to pressing equipment for pressing.

7. Press the grape must using proper procedures.

8. Dispose of pomace using approved environmental methods.

9. Use appropriate procedures to analyze grape juice.

10. Rack, filter, and centrifuge grape juice to remove insoluble solids.

11. Add amelioration solutions to juice.

12. Use proper procedures to analyze grape juice after amelioration.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: FERMENTING THE JUICE

Performance Objectives:

1. Monitor temperature of juice and fermentation rate.
2. Rack the wine as required.
3. Complete fermentation process.
4. Arrest fermentation process.
5. Maintain accurate records system.
6. Test wine and record results.
7. Taste wine for organoleptic evaluation.
8. Control quality of fermentation process.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CLARIFYING THE STILL WINE

Performance Objectives:

1. Add fining agents to wine.
2. Rack the wine.
3. Filter the wine with pad filtration.
4. Filter the wine with DE.
5. Stabilize the wine with cold temperature.
6. Filter and centrifuge the wine.
7. Test wine and correct.

8. Maintain an accurate records system.

9. Test wine and record the results.

10. Taste wine for organoleptic evaluation.

11. Control quality of clarifying process.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PACKAGING THE WINE

Performance Objectives:

1. Test wine prior to bottling.
2. Filter wine using pad filtration.
3. Arrange bottling line prior to bottling.
4. Prepare bottling line prior to bottling.
5. Bottle wine.
6. Close, capsule, label and case bottled wine.
7. Use proper techniques to store wine.

8. Prepare and release wine for distribution.

9. Maintain an accurate records system.

11. Test wine and record results.

12. Taste wine for organoleptic evaluation.

13. Control quality of wine packaging.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: PERFORMING OFF-SEASON DUTIES

Performance Objective:

Prepare winery for tourists and special events.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: CELLARING THE WINE

Performance Objectives:

1. Use barrel aging techniques to develop French style wine.

2. Age wine in tanks.

3. Test and correct composition of wine.

4. Use proper equipment and techniques to blend wine.

5. Maintain an accurate records system.

6. Test wine and record results.

7. Taste wine for organoleptic evaluation.

8. Control quality of cellaring process.

CURRICULUM: ENOLOGY (WHITE WINE)

DUTY: SANITIZING THE EQUIPMENT

Performance Objectives:

1. Winterize, sanitize and repair winery equipment.
2. Maintain an accurate records system.
3. Test wine and record results.
4. Taste wine for organoleptic evaluation.
5. Control quality of sanitation process.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: COORDINATING HARVEST SCHEDULE

Performance Objectives:

1. Sample and analyze grape must to determine optimal harvest date.

2. Determine the yield potential and winemaking needs of the winery.

3. Prepare and transport grapes to winery for processing.

4. Prepare winery equipment and train personnel in equipment use prior to receiving grapes.

5. Maintain communication with vineyard manager relative to scheduling labor force for harvesting/transporting grapes and coordinating winery crew.

6. Determine appropriateproduction, financial, and regulatory information to maintain a comprehensive records system.

7. Use appropriate procedures to maintain an optimal

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PREPARING FOR THE CRUSH

Performance Objectives:

1. Use proper procedures to clean and sanitize winery equipment.
2. Use proper procedures to clean and sanitize all wine storage tanks and barrels.
3. Prepare, test and arrange winery equipment for crushing.
4. Prepare, test and repair cooling equipment of tanks and the winery facility.
5. Maintain an adequate inventory of winery supplies.
6. provide laboratory equipment and supplies necessary for laboratory test analyses.

7. Determine appropriate production, financial and regulatory information to maintain a comprehensive records system.

8. Use suitable procedures to assure quality throughout the crushing phase.

9. Use proper procedures to prepare yeast starter solution.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: RECEIVING FRESH GRAPES

Performance Objectives:

1. Weigh grapes according to the selected weigh procedures.
2. Use appropriate method of transferring grapes to receiving station.
3. After inspection, remove undesirable grapes.
4. Use proper procedures for holding /storing grapes.
5. Determine data necessary to maintain a comprehensive record-keeping system.
6. Maintain optimal quality of grapes by minimizing storage time/juicing and maintaining proper temperature.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PROCESSING OF GRAPES

Performance Objectives:

1. Crush and destem grapes as dictated by selected wine style.
2. Determine sulfite requirements and apply to grapes.
3. Using proper equipment and techniques, cool the must to desired fermenting temperature if wine style requires cooling.
4. Transfer must to primary fermenter for skin contact.
5. Use proper procedures to analyze must.
6. Add enzymes and yeast to must.
7. Add other amelioration solutions to must.
8. Keep appropriate records.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: FERMENTING THE MUST

Performance Objectives:

1. Prepare Malo-lactic fermentation.
2. Break the cap during fermentation.
3. Monitor temperature and fermentation rate.
4. Inoculate with Malo-lactic bacteria.
5. Press the wine.
6. Transfer to secondary fermenter and monitor residual sugars.
7. Dispose of pomace.
8. Monitor temperature and fermentation rate.

9. Restart stuck fermentations.

10. Stop fermentation process.

11. Taste wine for organoleptic evaluation and make necessary adjustments.

12. Record all aspects of fermentation process.

13. Maintain optimal quality by monitoring throughout fermentation process.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CLARIFYING THE STILL WINE

Performance Objectives:

1. Rack the wine.
2. Filter the wine and dispose of lees.
3. Stabilize the wine with cold temperature.
4. Fine, filter and centrifuge the wine.
5. Test wine and correct.
6. Maintain an accurate records system.
7. Taste wine for organoleptic evaluation.
8. Control quality of clarifying process.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: CELLARING THE WINE

Performance Objectives:

1. Age wine in tanks.
2. Top-up barrels.
3. Test and correct composition of wine.
4. Use proper equipment and techniques to blend wine.
5. Test wine and record results.
6. Taste wine for organoleptic evaluation.
7. Control quality of cellaring process.
8. Test wine and record results.

9. Taste wine for organoleptic evaluation.

10. Prepare and release wine for distribution.

11. Maintain an accurate records system.

12. Control quality of wine packaging.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: PACKAGING THE WINE

Performance Objectives:

1. Test wine prior to bottling.
2. Filter wine using pad filtration.
3. Arrange for bottling line prior to bottling.
4. Prepare bottling line prior to bottling.
5. Bottle wine.
6. Clsoe, capsule, label and case bottled wine.
7. Use proper techniques to store wine.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: SANITIZING THE WINERY

Performance Objectives:

1. Prepare winery for tourists.
2. Winterize, sanitize and repair winery equipment.
3. Maintain an accurate records system.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: OVERALL QUALITY CONTROL

Performance Objectives:

1. Maintain complete quality control systems throughout all winemaking processes.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: GENERAL EVALUATION OF WINE

Performance Objectives:

1. Test wine and maintain accurate records.

2. Taste wine and maintain accurate records.

CURRICULUM: ENOLOGY (RED WINE)

DUTY: DEVELOPING A MARKETING SCHEME

Performance Objectives:

1. Initiate a strategic marketing system.
2. Develop a distribution network.
3. Monitor markets.

EVALUATION MEASURES

Evaluation measures include the manner in which you test the student to be sure that the performance objectives and performance steps have been met. The evaluation measures should be based directly on the task performance objectives and performance steps identified in the task analysis process. These evaluation measures may be either practical or written as determined by the stated objectives. Examples of evaluation measures for performance and knowledge are presented on the following pages.

PERFORMANCE TEST

Student's Name: Date:

Competency Number And Statement:

Directions:

Performance Standards:

Evaluation:

Level Achieved		Performance Levels
	4	Can perform this skill without supervision and with initiative and adaptability to problem situations.
	3	Can perform this skill satisfactorily without assistance or supervision.
	2	Can perform this skill satisfactorily but requires some assistance and/or supervision.
	1	Can perform parts of this skill satisfactorily, but requires considerable assistance and/or supervision.
	0	Cannot perform this skill.

Instructor will initial level achieved.

KNOWLEDGE TEST

Student's Name: Date:

Competency Number and Statement:

Directions:

Examination Items:

Student's Score:
( ) Passed ( ) Failed

Instructor's Signature:

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